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A QUARTERLY RECORD OF
CRYPTOGAMIC BOTANY
AND ITS LITERATURE.

EDITED BY M. C. COOKE, M.A., A.L.S.,

Author of "Handbook of British Fungi," "Illustrations of British Fungi," "Fungi, their uses," &c., "Rust, Smut, Mildew, and Mould," "British Fresh Water Algæ," "British Desmids," &c., &c.

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Grevillea.

A QUARTERLY RECORD OF CRYPTOGAMIC BOTANY
AND ITS LITERATURE.

NEW ZEALAND FUNGI.

BY M. C. COOKE.

Agaricus (Volvaria) primulinus, *Cke. & Mass.*

Pileo carnosus, molli, e campanulato expanso (2 unc. lat.) innato-fibrilloso, subviscoso, disco purpureo, margine citrino, stipite farcto, deorsum leniter incrassato (2-3 unc. long), citrino, glabro; volva adnata, margine libero, ochraceo, lamellis liberis, ventricosis, pallido citrinis, sporis ellipticis, glabris, carneis ($10 \times 6 \mu$).

On the ground. New Zealand. (*Berggren* 136.)

Agaricus (Naucoria) aurora, *Cke. & Mass.*

Pileo carnosulo, e campanulato convexo, obtuse umbonato, aureo, glabro ($1-1\frac{1}{2}$ unc. lat.), stipite subcavo, cylindrico, glabro, æquali, subflexuoso (3 unc. long, 3 lin. crass), pallidiore; lamellis subliberis, postice rotundatis, latis, cinnamomeis, sporis $7-8 \times 4 \mu$.

On the ground. New Zealand. (*Berggren* 134.)

Gregarious.

Agaricus (Naucoria) galanthinus, *Cke. & Mass.*

Pileo tenui, carnosulo, campanulato, vix uncialis, obtuse umbonato, lævi, albido, margiu incurvo, plicato, sublobato; stipite tenui, cylindrico (2-3 unc. long, 2 lin. crass), fistuloso, glabro, albo, lamellis adnexis, subconfertis, cinnamomeis. Sporis ellipticis, $12-6 \mu$.

On the ground. New Zealand. (*Berggren* 142.)

Allied to *Agaricus nasutus*, Kalch.

Agaricus (Stropharia) lepiotæformis, *Cke. & Mass.*

Pileo carnosus, campanulato, obtuse umbonato (2-3 unc. diam.), albido-ochraceo, squamis innatis ornato, margine tenui, flocculoso; stipite cavo, æquali, albido, glabro (3 in. long $\frac{1}{3}$ unc. crass), annulo tenui, fugaci, lamellis rotundato-adnatis, antice attenuatis, subconfertis, brunneo-fuscis. Sporis amygdaloideis, $8-10 \times 5 \mu$.

On the ground. New Zealand. (*Berggren* 39.)

Polyporus (Hispidi) setiger, *Cke.*

Pileo dimidiato vel reniformi, carnosus, molli, strigosus, cervino ($1-2$ unc. diam.), intus fibroso, candido; hymenio albo, leniter concavo, margine acuto. Tubulis elongatis. Poris minutis, subrotundis, dissepimentis tenuissimis.

On rotten logs. New Zealand. (*Colenso* 517.)

Polyporus (Hispidi) atrostrigosus, Cke.

Pileo dimidiato, carnoso, postice effuso, olivaceo-fuligineo; pilis strigosis adpressis virgato, margine acuto, contextu albo, tubulis elongatis, poris albis, minutis, rotundatis, dissepimentis tenuibus.

On stumps, etc. New Zealand. (*Colenso* 522.)

With somewhat the appearance of a *Polystictus*, but *anodermeous*.

Pileus 1-2 inches or more diam., half an inch thick behind.

Craterellus insignis, Cke.

Erectus, caespitosus; pileo flabelliformi, alutaceo (ad 1 unc. lato), margine lobato-crenulato, striato, stipite gracili ($\frac{1}{2}$ -1 unc. long), concolori, sursum in pileo expanso, deorsum attenuato. Hymenio ceraceo, rugoso, obscuriori. Sporibus ovalibus, $2-3 \times 1\frac{1}{2} \mu$, fusco-hyalinis.

On decayed stump. New Zealand. (*Colenso* 518.)

Clavaria humilis, Cke.

Gregaria, pusilla, alba, simplex, vel parce ramoso-incisa, laevis, nuda, glabro, stipite brevi, vix distincte, infra attenuato.

On rotten wood amongst moss. Maingaroa. New Zealand. (*Berggren* 398).

About half an inch high.

Pistillina stilboidea, Cooke. Crinula stilboidea, *Cooke in Herb. Kew.*

Erumpens, minuta, carnosa, gregaria, tota pallide ochracea. Clavulis erectis, capitatis (vix mm. alt.), glaberrimis capitulo globoso-depresso, cavo, hymenifero ($\frac{1}{4}$ -1 mm. diam.) Stipite cylindrico, aequali, solido, pruinoso ($1\frac{1}{2}$ mm. long.), ad basim cupulato-volvato; basidiis cylindrico-clavulatis, hyalinis, sporibus ovatis, hyalinis, $4 \times 3 \mu$.

On leaves of *Panax*. New Zealand. (*Berggren* 275, *Colenso* 423.)

It scarcely seems to differ from *Clavaria* in structure, but the hollow globose heads and cupulate base of the stem appear to separate it from that genus.

To this genus the following must also be referred:—

Pistillina paradoxa, B. & C.

Crinula paradoxa, B. & C. in *Rav. Fungi Car. Exs. iii.*, 35. *Rav. Fungi Amer. No. 399.* *Thuemen Myc. Univ.* 208. *Ellis N.A. Fungi No. 23.*

On living leaves of *Quercus*. United States.

Uromyces azorellæ, Cke.

Soris plerumque elongatis, bullatisque, in petiolis, in foliisque rarioribus, fuscis, pulverulentis. Teleutosporis ovatis, laevibus, breviter pedicellatis, episporio ad apicem incrassato, $12 \times 8 \mu$.

On leaves and petioles of *Pozoa trifoliata*. New Zealand. (*Colenso* 866.)

Puccinia Coprosmae, Cke.

Hypophyllis. Maculis orbicularibus (1 c.m.) fuscis. Soris congestis, convexis, umbrinis, compactis. Teleutosporis ellipticis,

compressis, difformibusque, constrictis, cellulis inferioribus elongatis, hyalino-fuscis, pedicellis abbreviatis ($0.28-0.3 \times 0.1$ mm.).

On leaves of *Coprosma lucida*, Stewart Island. New Zealand. (Kirk 138.)

Uredo compositarum, var. *Celmisiae*.

Spores pale, verruculose, $26-30 \times 22 \mu$.

On leaves of *Celmisia longiflora*. New Zealand. (Colenso 777.)

Uredo Acaciae, Cke.

Soris bullatis, plerumque cauliculis, fuscis, elongatis, difformibus. Uredosporis subglobosis, laevibus, circa 18μ diam., pedicellis hyalinis diffluentibus sustultis.

On living young twigs of *Acacia*. New Zealand. (Colenso 1050.)

Didymospharella flicina, Cke.

Sparsa, tecta. Peritheciis globosis, atris, minutis, ostiolis papillatis; ascis cylindraceis. Sporidiis uniseriatis, ovalibus, medio septatis, nec constrictis, fuscis, $8 \times 5 \mu$.

On *Pteris* stems. New Zealand. (Colenso 307.)

Læstadia hepaticarum, Cke.

Peritheciis minutis, demum semiemersis, atris, subglobosis, poro pertusis. Ascis pyriformibus, octosporis. Sporidiis ellipticis, hyalino-fuscis, continuis, $5 \times 3 \mu$.

On *Hepaticæ*. New Zealand. (Colenso 507.)

Sphærella junciginea, Cke.

Peritheciis in maculis orbicularibus gregaris atris, parenchymate immersis, in acervulos elongatos phyllachoriformes, epidermide nigricata velatos, plerumque subparallele aggregatis, sphæroideis, demum rima longitudinaliter exposita. Ascis cylindraceis, octosporis, sporidiis subfusiformibus, dilynis, medio vix constrictis, rectis curvulisve, luteo-hyalinis ($0.12-0.14 \times 0.03-0.035$ mm.).

On culms of *Juncus vaginatus*. Stewart Island, New Zealand. (Kirk 207.)

Closely allied to *Sph. phyllachoroides* Sacc., but forming definite spots.

Phoma Colensoi, Cke.

Peritheciis per corticem erumpentibus, gregaris vel sparsis, subglobosis, atris, sporulis ovalibus, continuis, hyalinis, $3 \times 2 \mu$.

On twigs of poplar. New Zealand. (Colenso 286.)

Asteromella myriadea, Cke.

Peritheciis minutissimis, numerosis, hypophyllis, maculam obscuram efficiuntibus, dense gregaris, globosis, emersis, atris. Sporulis cylindraceis, utrinque rotundatis, rectis vel paullum, curvulis, $1.2 \times 2-3 \mu$, hyalinis.

On coriaceous leaves. New Zealand. (Colenso 432.)

Sphæronema Solandri, Cooke.

Peritheciis gregaris, cylindricis, subtruncatis, atris, laevibus; sporulis ovatis, hyalinis, $3-5 \times 2 \mu$.

On wood of *Fagus Solandri*. New Zealand. (Kirk 32.)

Coniothecium subglobosum, *Cke.*

Epiphyllum, gregarium vel sparsum, punctiforme, nigrum. Pustulis applanatis, planis, sine peritheciis, epidermide nigrofacta tectis. Sporulis subglobosis (.008-.01 mm. diam.) ; obscure septatis, opacis, atro brunneis, asperulis.

On leaves of monocotyledonous plant growing in "Tara" swamps. Roritonga.

Chaetomella eucrypta, *Cke. & Mass.*

Peritheciis immersis, demum erumpentibus, membranaceis, olivaceis, saepe subcupularibus, setosis ; setis paucis, strictis, septatis ; sporulis amygdaloideis, atro-olivaceis, $16 \times 10 \mu$, plerumque ad basim hyalino-apiculatis.

On dead leaves of *Knightia excelsa*. New Zealand. (*Colenso* 864-1043.)

Sphaeronemella filicina, *Cke. & Mass.*

Peritheciis cylindricis (1 mm. long) carneis, apicem perforatis, superficialibus, sparsis. Sporulis continuis, ovalibus, hyalinis, $3 \times 2 \mu$.

On *Hymenophyllum*. New Zealand. (*Colenso* 786.)

Camarosporium pusillum, *Cke.*

Sparsa. Peritheciis punctiformibus, minutis, membranaceis, epidermide tectis, sporulis ellipticis, irregularibus, utrinque obtusis, 4-5 septatis, cellulo uno alterove longitudinaliter divisus, fuscis, $20-30 \times 8 \mu$.

On stems and receptacles of *Mesembryanthemum*. New Zealand. (*Colenso* 291.)

Cercospora aristoteliae, *Cke.*

Hypophyllis. Maculis brunneis, suborbicularibus, roseo-cinctis. Hyphis fasciculatis, brevibus, fasciculatis, conidiis cylindraccis, ad apicem subattenuatis, 60-70 μ long, 3-4 μ lat. ; multi-nucleatis, spurieque septulatis, hyalinis.

On leaves of *Aristotelia racemosa*. New Zealand. (*Colenso* 857.)

Fusarium elongatum, *Cke.*

Sporodochiis erumpentibus, carnosus, convexus, compactis, aurantio-rubellis. Hyphis tenuibus, ramulosis, stipatis, conidiis in ramulorum apice insidentibus, tenuis, elongatis, fusiformibus, paullum curvatis, acutis 5-7 septatis, hyalinis 60-70, saepe 80 μ long, 2-3 μ crass.

On twigs. New Zealand. (*Colenso* 538.)

Fusarium carneo-roseum, *Cke.*

Erumpens, tuberculæforme, carneo-roseum. Sporis fusiformibus, curvulis, hyalinis, 3-5 septatis, pallide roseotinctis (.045-.05 \times .005, mm.)

On bark. New Zealand. (*Kirk* 143.)

Probably the conidia of *Nectria otagensis*, Curr.

AUSTRALIAN FUNGI.

By M. C. COOKE.

Agaricus (Entoloma) galbineus, *Cke. & Mass.*

Totus sulfureus, pileo leviter carnoso, e convexo expanso, late umbonato (1-2 unc. lat), sulfureo, umbone croceo, udo, glabro; stipite æquali, fibrilloso, concolori, fistuloso (2 unc. long, 2-3 lin. crass.), lamellis leviter adnexus, ventricosus, pallidis, sporis roseis, globoso-angulatis, $10\ \mu$ diam.

On the ground. Walhalla. (*Tisdall* 48.)

Agaricus (Leptonia) quinquecolor, *Cke. & Mass.*

Pileo membranaceo, convexo, glabro, subvirgato, margine flavido, disco lateritio-fusco, striis roseo-tinctis (subuncialis), stipite cylindrico, æquali, vel leniter sursum attenuato, fistuloso, badio, deorsum albiofocculoso (circa 2 unc. long 1 lin. crass.), plerumque cæspitoso, lamellis sinuato adnatis, roseis, sporis globosis, asperulis, 8-10 μ .

On black loam. Walhalla. (*Tisdall* 54.)

Asteromella Acaciæ, *Cke.*

Peritheciis numerosissimis, maculam atram efficientibus, dense congestis, minutis (vix 25 μ excedentibus) atris, membranaceis, poro pertusis. Sporulis arcte ellipticis, continuis, hyalinis, rectis, $2\frac{1}{2} \times 1\ \mu$.

On phyllodes of Acacia. Wedderburn. (*Martin* 506.)

Septoria Martinii, *Cke.*

Maculis epiphyllis, griseis, confluentibus, atrocinctis; peritheciis punctiformibus, globoso-depressis, membranaceis, pertusis. Sporulis cylindræis, curvulis vel flexuosis, $20-40 \times 3\ \mu$, multo-guttulatis demum 3-5 septatis, hyalinis.

On leaves of *Senecio Bedfordii*. Victoria. (*Mrs. Martin* 461.)

Allied to *S. anaxæa*, Sacc.

Hyaloceros dilophospora, *Cooke.*

Epiphyllis. Acervulis gregariis, minutis, fuscis, erumpentibus, convexis subangulatis, centro irregulariter fissurato, stromate submucoso; conidiis elongatis, subfusoides, $25 \times 4\ \mu$, leniter curvatis triseptatis, ad septa non constrictis pallide fuscis, utrinque setis binis divergentibus, hyalinis, ornatis.

On dead leaves of *Leptospermum scoparium*. Port Philip. (*C. French, jun.*)

This species would constitute a subsection of the genus, having two setæ at each end of the spore, instead of one.

SOME AFRICAN FUNGI.

By M. C. COOKE.

Agaricus (Crepidotus) Inandæ, Cooke.

Pileo carnosulo, molli, laterali, reniformi, sessili, villosulo, ochraceo, siccitate fusco, mycelio amplo flavide-pallidove intertexto, lamellis latis, vix confertis, cinnamomeis. Sporis subglobosis (0.004 mm. diam.)

On bark. Inanda, Natal. (*J. M. Wood* 680).

Pileus half-an-inch to an inch broad, sessile, reniform, villose, especially behind, with flexuous tawny hairs; mycelium yellowish or pallid, sometimes interwoven into a byssoid stroma.

Æcidium Tylophoræ, Cooke.

Epiphyllum et caulicolum. Maculis purpureis, orbicularibus, vel in caulam effusis. Pseudo-peridiis semi-immersis, margine albo, lacerato. Sporis subglobosis, aurantiis.

On *Tylophora*. Natal. (*Wood* 694).

When on the stems twisting and contorting them considerably.

Uredo Balsamodendri, Cooke.

Hypophylla. Maculis indeterminatis, brunneis, soris sparsis, minutis, fuscis, pulverulentibus; uredosporis ellipticis, plerumque apicem versus granulato-verrucosis, fuscis, $35 \times 18 \mu$.

On leaves of *Balsamera*. Durban. (*J. M. Wood* 689).

Uredo cryptolepidis, Cooke.

Hypophylla. Maculis obsoletis, soris minimis, pallide fuscis, 5-10 aggregatis, mox epidermide fissa cinctis; uredosporis globosis, asperulis, pallidis, 18μ diam.

On leaves of *Cryptolepis*. Inanda. (*J. M. Wood* 672.)

Uromyces anomathecæ, Cooke.

Amphigena. Soris subtransversalis ellipticis, brunneis, compactis, minutis, teleutosporis pyriformibus, vel subtriangularis, apice incrassatis, badio-fuscis, deorsum pallidioribus, breviter stipitatis, episporio lævi, $25 \times 25 \mu$.

On *Anomatheca cruenta*. Natal. (*J. M. Wood* 693.)

Passalora protearum, Kalch & Cooke MSS.

Epiphylla. Maculis irregularibus, sordidis. Hyphis fasciculatis, brevibus, conidiis subfusoidis, aerogenis, uniseptatis, loculo superiori crassioribus, pallidis, $35-40 \times 7 \mu$.

On leaves of *Protea argentea*. Cape of Good Hope.

Stilbum physarioides, Kalch, Sacc. Syll. No. 2731.

Stipitibus sparsis, vitellinis, brevibus, deorsum incrassatis; capitulo subgloboso, laxo, albido; hyphis furcatis, vel breviter ramulosis. Conidiis ellipticis, hyalinis, $4-5 \times 2 \mu$.

On herb stems. Cape of Good Hope.

Leptosphaerella Helichrysi, Cooke.

Hypophylla, superficialis. Peritheciis subglobosis, opacis, atris, in tomento nidulantibus, ostiolo impresso, pertuso. Ascis clavatis. Sporidiis congestis, sublanceolatis, triseptatis, rectis, curvulisve, fuliginis ($0.05-0.055 \times 0.008$ mm.)

On under surface of leaves of *Helichrysum*. Natal, (Wood 683.)

SOME ASIATIC FUNGI.

By M. C. COOKE.

Agaricus (Hebeloma) Thomasinus, Cooke.

Pileo carnoso, subviscido, convexo, expanso, obtuso (6-8. in diam.), ochraceo-fusco, margine tenui, lacerato. Stipite crasso, ruguloso, deorsum incrassato (5-6 in. long, $1\frac{1}{2}$ in. crass.), cum pileo concolore; lamellis lanceolatis, postice attenuatis, latis, vix confertis, pallidis, demum umbrinis.

Growing in a cactus-hedge. Belgaum, India. (Mrs. Patteshall Thomas.)

Agaricus (Stropharia) mephistopheles, Cooke.

Pileo carnoso, companulato-convexo, late umbonato ($1\frac{1}{2}$ -2 in. diam.), igneo-rubro, verrucis deciduis concoloribus adperso, margine appendiculato, annulo superiori, patente; stipite tenui, cum pilei concolore, sub-glabro (2-3 in. long, 2-3 lines thick); lamellis lanceolatis, affixis, subconfertis, umbrino-nigricantibus.

On the ground. Belgaum, India. (Gen. Hobson, No. 11-14.)

Allied to *A. aureo-fulva*, B., but differing in habit and habitat.

Phyllachora japonica, Cke. & Mass.

Erumpens, oblonga vel confluens (1-2 mm. diam.), grisea, convexo-applanata, tenuis; cellulis minutis immersis, nec prominulis. Ascis cylindraceutis sporidiis uniserialibus, ellipticis, continuis, hyalinis, $7-8 \times 4 \mu$.

On stems of *Vaccinium Japonica*. Patung District, China. (Dr. A. Henry.)

Bearing a general resemblance externally to *Botryosphaeria dothidea*.

Sacidium depazeoides, Cooke.

Peritheciis in maculas suborbicularibus vel confluentibus, ochraceis, insidentibus, membranaceis, demum sursum dissilientibus. Sporulis globosis, subglobosisve, hyalinis, 12μ diam.

On leaves of *Aspidopteris caudata*, India.

NEW BRITISH FUNGI.

BY M. C. COOKE.

(Continued from Vol. XVIII., p. 74.)

Pleospora junciginea, Cooke.

Perithecia scattered, erumpent, globose, black, papillate, at length cracking, and throwing off fragments of the cuticle. Asci cylindrical, octosporous. Sporidia uniseriate, elliptical, constricted at the middle, 5-septate, and muriform, amber yellow, $25-30 \times 10-12 \mu$.

On *Juncus*. North Wootton; also California (*Harkness*, No. 1301).

Pleospora sparganiæ, Cke.

Perithecia scattered, immersed in the parenchyma, covered by the cuticle, rather small, globose, minutely papillate. Asci clavate. Sporidia biseriata, lanceolate, 3-4 septate, constricted, median cell longitudinally divided, yellowish-brown, $30 \times 8 \mu$.

On *Sparganium*. North Wootton 19.

Phyllosticta Draconis, Berk. & Welm. *Crypt. Lusit.*, Sacc. *Syll.* No. 334.

Spots on both surfaces, irregular, pallid, with a purple margin. Perithecia minute, pale, very thinly membranaceous, seated on the spots, but scarcely visible to the naked eye. Sporules minute, elliptical, continuous ($7 \times 3 \mu$), on very short basidia.

On leaves of *Dracæna terminalis*, and *D. Cooperi* in conservatories.

Diplodia acerina, Cke. & Mass. (cum *Leptorrhaphis acerina* Rehm. *Asco.* No. 197).

Peritheciis tectis, subsparsis, globuloso papillatis, atris, vix conspicuis. Sporulis constricto-didymis, brunneis, utrinque rotundatis, $17 \times 9 \mu$.

On *Acer campestre* bark. Germany; Britain.

Isariopsis acanthacearum, Cooke.

Hypophyllous. Forming minute, somewhat compact, semi-orbicular tufts, which are at first pale cinereous, becoming fuliginous, or nearly black. Hyphæ slender, septate, flexuous, interwoven, brown. Conidia fusiform, triseptate, hyaline ($0.02-0.022 \times 0.005$ mm.).

On leaves of *Eranthemum*. Bristol (Dewar). On leaves of *Dædalacanthus nervosus*. Exeter (E. Parfitt).

Glæosporium mezereum, Cooke.

Epiphytal. Pustules gregarious, small, brown, with a paler centre, sometimes confluent; sporules elliptical, or nearly almond-shaped, with 1-2 or more guttules ($15 \times 6 \mu$), continuous, hyaline, at first with very short sporophores.

On fading leaves of *Daphne mezereum*. Kew Gardens.

INTRODUCTION TO FRESH WATER ALGÆ.

An unpretending little volume, under this title, has lately been published in the "International Scientific Series," and it is the first time that a handy manual of Fresh Water Algæ has been published, with descriptions of all the British species, and figures of the genera, at the reasonable price of five shillings. It will surprise some of our readers that the "Journal of Botany" could have admitted to its pages such a violent panegyric as we hereby re-print for their edification.

"The author of this book deserves the highest credit for his good intentions. To furnish the public with a book of handy size containing descriptions of the British Fresh Water Algæ, and figures of all the genera, with an introduction to their study—all this at a reasonable price—is an aim of the most worthy kind. The plan of the book and the idea of producing it are most creditable to Mr. Cooke, but he should have induced someone else to carry the matter into effect.

"Soon after the publication of Cooke's 'British Fresh Water Algæ,' it was shown by Dr. Nordstedt in these pages ('Journ. Bot.,' 1887, 355), and by other writers elsewhere, that Mr. Cooke's claims to illustrate this subject are of the most slender character.* Mr. Cooke's methods of book production were then laid bare, and the character of many of his figures was properly described by the most eminent living authority on this subject. It is, of course, impossible for us to know whether Mr. Cooke took that lesson to heart, and has prepared the present volume as some sort of apology for his more ambitious work, or whether he remains 'of the same opinion still.' Judging from the book before us, the latter view is much the more likely one. In the Introduction, p. 6, Mr. Cooke says:—"The historical review may be briefly summarized by dividing it into three epochs, of about forty years' duration for each, the first being limited by the publication of Dillwyn's "Confervæ," the second by Hassall's "Fresh Water Algæ," and the third by Cooke's "British Fresh Water Algæ." Here is an author who refers to his own book as an epoch-making one! and such a book! Phycologists live in perilous times when Cooke's 'British Fresh Water Algæ' marks an epoch.

"Those who know Mr. Cooke's numerous and varied writings are familiar with his refreshing habit of speaking out the faith that is in him without deference to authority, and with hard words for those who may excite his wrath. His chapter on 'Classification' in this book contains a scathing reference to Mr. A. W. Bennett's classification of Algæ, and his chapter on what is here called the 'Dual Hypothesis' is to be noted for its outspoken language. Mr. Cooke must be aware that in this matter he lives in a very

* This is a misrepresentation, as the communication quoted does not allude to "British Fresh Water Algæ" at all, but to a subsequent work.

Crystal Palace of glass, and no doubt he is prepared for sportsmen who may be inclined to return his fire. Let us look at this chapter on the 'Dual Hypothesis,' not that there is anything dual about the hypothesis, but only about the subjects of it. Most reasonable people have spontaneously remarked that in the controversy, while it lasted, on the subject of the dual nature of lichens, the systematic lichenologists were ranged on one side, and the morphologists pitched over against (and into) them. It was further noted that the question was really one for morphologists to settle, and they settled it. To treat the controversy, with Mr. Cooke, as still active would be absurd. One might as well describe the battle of Balaclava as still in progress because survivors happily remain with us. The question was settled, and it was not decided in favour of the systematists, headed by Nylander. Mr. Cooke, however, digs up the hatchet, and goes for de Bary, Schwendener, and the rest, just as if there were some novelty left in his proceedings. He fortifies himself with the following inspiring sentence written by 'Dr. Nylander, the prince of lichenologists':—'I have adduced that the gonidia and gonimia of lichens constitute a normal organic system necessary, and of the greatest physiological importance, so that around them we behold the growing (or vegetative) life chiefly promoted and active.' Mr. Cooke quotes this sentence with special approval, and if he can understand it, no doubt he is entitled to use it. For our own part it appears to us that the man who could write a sentence like that is very unlikely to take a lucid view of anything.

"It is difficult to take seriously the work of any man on Fresh Water Algæ who describes, in this year of grace 1890, the symbiosis of lichens as a 'hallucination' (p. 183). It may be well enough—it is intelligible at any rate—that men like Nylander, Krempelhuber, and others, cited by Mr. Cooke, who have more or less confined their studies to systematic lichenology (a branch of study differing remotely from systematic botany in its extraordinary and absurd methods),—it is well enough that these men should cling to their ancient faith, but when an author presents to the public a book which professes to teach the form and structure of Fresh Water Algæ, it might surely be expected that he should leave this matter alone or take a reasonable view of it. Let him point to distinguished authorities on Fresh Water Algæ who fail to recognize these among the 'gonidia' of lichens! If Mr. Cooke expects an attentive hearing on this matter let him not proclaim his own ignorance.

"The first 190 pages of this book are of an introductory character. The chapters are on such subjects as collection and preservation, cell-increase, polymorphism, asexual and sexual reproduction, conjugation, pairing of zoospores, alternation of generations, spore germination, spontaneous movements, notable phenomena (such as the 'breaking of the meres,' Red Snow, Gory Dew, Blood Rain), the dual hypothesis and classification. Over the ground covered by this list of subjects, there is, indeed, wanted

a good trustworthy popular guide, though the literature is easily enough got at by students. Mr. Cooke would have been the better for such a guide. His knowledge of the literature as displayed here is certainly scanty and by no means recent. To point out this inadequacy of treatment in anything like detail would be labour spent in vain.

"After this introductory portion we have the systematic portion, consisting of short descriptions of the British Fresh Water Algæ and at the end the figures of the genera. This is better. It might be objected to the descriptions that they are short—so they are, but on the whole they are judiciously shortened; and considering the author's previous work on this subject, there is reason for some satisfaction with this portion of the book. The author contents himself with these descriptions and a reference to his own larger book, and steers clear of the pitfalls of synonymy. As for the plates, they are mostly outline figures redrawn on stone from Cooke's larger book and other sources. It may be that there is somewhere in this book an acknowledgment of the *original* sources of some of these figures, but we have not yet found the place. However, Dr. Nordstedt has already so fully shown what Mr. Cooke can do in this way on a larger scale that there is no special need to deal with the matter. These figures of the genera and the page giving their names constitute the really useful part of this book. It cannot be claimed for it that it embodies the work of an original worker in this field, or of a man who has an extensive, practical first-hand knowledge of the subject, but so far as the latter part (containing the descriptions and figures) is concerned, it may be said of it that it is worth the price charged as a help to the beginner in naming specimens. As for guidance in the structure, life-history, and relationships of these organisms, the student need expect none of it."—G. M., in *Journal of Botany*, August, 1890.

We shall offer no remarks upon this singular effusion, which will be estimated at its true value by all with whom the "chivalry of a gentleman" is more than an empty phrase. Three facts may serve to illustrate the reason for its production:—(1) The writer of it was one of the authors of the "philosophical system" which was *not* accepted in the Introduction (p. 188). (2) After subscribing to the "*Journal of Botany*" for fifteen years, the author of the "Introduction" thought fit to cease to subscribe with the current year. (3) The writer of the "review" is attached to the botanical department of the Natural History Museum, and the author of the "Introduction" is similarly attached to the Herbarium of the Royal Gardens at Kew. This will be sufficient to account for a *great deal* with all who know what genial feelings have been manifested for many years between the two establishments. Read by the light of these facts, it will be clear that it was the *author*, and not the *book*, which was intended to be condemned.

BRITISH PYRENOMYCETES.

By G. MASSEE.

(Continued from p. 60.)††† *Sporidia* 7 septate.*P. asparagi*, *Rabh.*, *Sacc. Syll.* 3805.

On asparagus. Not uncommon.

P. allii, *Rabh.*, *Sacc. Syll.* 3806.On *Allium cepa*. Twycross.*P. heleocharidis*, *K.*, *Sacc. Syll.* 3817.On *Eleocharis palustris*. Lynn.*P. subriparia*, *Cke.*, *Sacc. Syll.* 3818.On *Carex riparia*. N. Wootton.GEN. 9. **PYRENOPHORA**, *Fr.* *Perithecia* setulose, sporidia muriform.*A. EUPYRENOPHORA. Perithecia* sclerotiform.*P. trichostoma*, *Fr.*, *Sacc. Syll.* 3842.

On stems of various grasses. King's Lynn.

P. phæocomes, *Reb.*, *Sacc. Syll.* 3843; *Hdbk.* 2785.

On dead leaves of grasses. Highgate, Shere, Glamis.

B. CHÆTOPLEA. Perithecia between leathery and membranaceous.*P. calvescens*, *Fr.*, *Sacc. Syll.* 3845; *Hdbk.* 2723.On *Atriplex*. Kentish Town; Lynn; Hasbro'.*P. phæocomoides*, *Sacc.*, *Sacc. Syll.* 3848. = *phæocomes*, *B.*
& *Br. p. p.*

On dead vine branches. King's Cliffe.

C. CAPRONIA, Sacc. Asci 16 spored.*P. sexdecemspora*, *Cke.*, *Sacc. Syll.* 3872.

On dead branches. Shere.

Fam. 16. **FOLIICOLÆ**, *Fr.*, *S. M. ii.*, 513. *Perithecia* innate, chiefly on leaves.GEN. 1. **LÆSTADIA.** Sporidia continuous, hyaline.* **GENUINA.** *Asci* without paraphyses.*L. punctoidea*, *Cke.*, *Sacc. Syll.* 1592; *Hdbk.* 2751.

On the upper surface of oak leaves. Jedburgh; Shere.

L. Cookeana, *Awd.*, *Sacc. Syll.* 1596; *Hdbk.* 2750.

On dead leaves. Common.

- L. veneta*, *S. & Sp.*, *Sacc. Syll.* 1600.
On *Platanus* leaves. Kew.
- L. acerifera*, *Cke.*, *Sacc. Syll.* 1604; *Hdbk.* 2755.
On dead leaves of *Acer campestre*. Shere; Darenth.
- L. faginea*, *Cke. & Pl.*, *Sacc. Syll.* 6001.
On leaves of *Fagus sylvatica*. Lynn.
- L. buxi*, *Fckl.*, *Sacc. Syll.* 6003; *Hdbk.* 2775.
On dead box leaves. Milton.
- L. perpusilla*, *Desm.*, *Sacc. Syll.* 1608.
On leaves of grasses, *Typha*, &c. N. Wootton.
- L. rhytismoides*, *Berk.*, *Sacc. Syll.* 1611; *Hdbk.* 2801.
On leaves of *Dryas*. Sutherlandshire.
- L. carpineae*, *Fr.*, *Sacc. Syll.* 1619; *Hdbk.* 2756.
On dead hornbeam leaves. Common.
- L. rhodorae*, *Cke.*, *Sacc. Syll.* 6378.
On *Rhododendron*. Kew.
- L. iridis*, *Cke. in Grevillea*.
On *Iris*. Kew.

** *PHYSALOSPORA*. With paraphyses.

- P. ilicis*, *Schl.*, *Sacc. Syll.* 6390.
On dead holly leaves. Apethorpe.

GEN. 2. **SPHÆRELLA**. Sporidia uniseptate, hyaline.

A. ON DICOTYLEDONS.

* On leaves of trees and shrubs.

- S. punctiformis*, *Pers.*, *Sacc. Syll.* 1819; *Hdbk.* 2750.
On dead leaves. Common.
- S. maculiformis*, *Pers.*, *Sacc. Syll.* 1820; *Hdbk.* 2742.
On fallen leaves. Common.
- S. oblivia*, *Cke.*, *Sacc. Syll.* 1822; *Hdbk.* 2746.
On the under surface of dead chestnut leaves. Darenth Wood,
Kent.
- S. simulans*, *Cke.*, *Sacc. Syll.* 1826; *Hdbk.* 2748.
On dead oak leaves. Highgate.
- S. taxi*, *Cke.*, *Sacc. Syll.* 1836.
On leaves of *Taxus baccata*. Cornwall; Bradford Abbas.
- S. ligustri*, *Desm.*, *Sacc. Syll.* 1835; *Hdbk.* 2760.
On dead privet leaves. Dartford, Shere.
- S. hedericola*, *Desm.*, *Sacc. Syll.* 1841.
On ivy leaves. Kew.
- S. sentina*, *Fr.*, *Sacc. Syll.* 1845.
On dead leaves. Audley End, Essex.
- S. latebrosa*, *Cke.*, *Sacc. Syll.* 1848; *Hdbk.* 2754.
On sycamore leaves. Shere.
- S. fagi*, *Auers.*, *Sacc. Syll.* 1851.
On beech leaves.

- S. cratagi*, *Fckl.*, *Sacc. Syll.* 1852; *Hdbk.* 2745.
 On hawthorn leaves. Shere; Lynn.
S. arcana, *Cke.*, *Sacc. Syll.* 1859; *Hdbk.* 2747.
 On dead leaves of *Castanea vesca*. Darenth.
S. millegrana, *Cke.*, *Sacc. Syll.* 1860; *Hdbk.* 2753.
 On fallen leaves of hornbeam and lime. Shere, Surrey.
S. sparsa, *Wallr.*, *Sacc. Syll.* 1862; *Hdbk.* 2743.
 On leaves of lime and chestnut. Darenth, Shere, Wandsworth.
S. Capronii, *Sacc. Syll.* 1868; *Hdbk.* 2744.
 On fallen willow leaves. Shere.
S. macularis, *Fr.*, *Sacc. Syll.* 1873.
 On fallen poplar leaves. Apethorpe.

MUSCOLOGIA GALLICA, PART 9.

M. Husnot has just issued the 9th part of his *Muscologia Gallica*, ending with page 284, and 79 plates; it also includes 10 plates in substitution for the first 10 plates of the work, and an analytical key to the genera. We have already called attention to this work, which is proceeding contemporaneously with the British one, by Dr. Braithwaite, and we fear that we must add equally sluggishly. It has occupied six years to produce the nine parts already published, and although it was contemplated to complete it in 14 similar parts, it is somewhat doubtful if it can be contained within that number, or finished, at the present rate of progress, within another three years. It must be expected that the patience of subscribers will get exhausted when they have to wait for ten years, or more, to see the end of a work which they are most anxious should be completed, and turned to a practical use. Surely Bryologists must be exceptionally unfortunate. Let us hope that no unforeseen event will transpire to leave either of these valuable works as only a splendid fragment.

NORTH AMERICAN FUNGI.

By M. C. COOKE.

Cyphella fumosa, *Cke.*

Submembranacea, cyathiforma, stipitata. Cupulis gregariis sparsisve, fumosis, primo expansis, demum siccis conniventibus, nigricantibus, glabris (1-1½ mm. diam. et. long.), sporis globosis.
 On rotting leaves of *Gladiolus*. S. Carolina. (*Rav.* 3071.)

Rhabdospora sabalensis *Cke.*

Peritheciis atris, gregariis, subglobosis, innato-erumpentibus, demum subsuperficialibus, ostiolo pertuso. Sporulis elongato-fusiformibus, subcurvulis, utrinque acutis, 5 septatis, hyalinis, 50-60 × 4 μ.

On petioles of *Sabal*. Aiken, S. Car. (*Rav.* 1462.)

Stilbum (Ciliciopodium) aurifilum, Gerard. Sacc. Syll. 2733.

Stipitibus elongatis, setulis strigosis, aureo-flavidis. Capitulo pyriformi vel clavato, albido. Conidiis minutissimis globosis, $1\ \mu$ vix excedentibus.

On *Dædalea unicolor*. U.S.A.

Uredo amsoniæ, Cke.

Hypophylla. Maculis obsoletis. Soris minutis, orbicularibus, pallidis, gregariis, primo tectis, dein lacero-erumpentibus. Uredosporis globosis, verruculosus, pallide flavidis, 20-22 μ .

On leaves of *Amsonia*. S. Carolina. (Rav. 2868.)

BRITISH THELEPHOREÆ.

The publication of Mr. G. Massee's monograph of the Thelephoreæ is proceeding rather slowly and gradually in the Journal of the Linnean Society. As some alterations are necessarily made in the nomenclature and arrangement of the British species, some indication of these corrections may be advisable, in the order of their publication.

GEN. 1. CONIOPHORA (D.C.). Massee.

Resupinately effused; hymenium even, powdery; spores coloured brownish.

A. MACROSPORÆ. Spores large (11-25 μ long).

- 1. Coniophora olivacea** (Fr.). Cooke Grev. VIII., 89. Berk. Outl. 269. Stev. Brit. Fung. II., 283.

Membranaceous, adnate, circumference fimbriate, whitish; hymenium thin, dull olive, powdery-tomentose; spores ellipsoid, ochraceous, $14-17 \times 10-12\ \mu$.

On pine trunks.

- 2. Coniophora pulverulenta** (Lev.). Cooke Grev. VIII., 89.

Effused, dry, ferruginous brown, circumference membranaceous, white; hymenium powdery; spores ellipsoid, yellow-brown, $15 \times 10\ \mu$.

On wood.

- 3. Coniophora puteana** (Schum.). Cooke Grev. VIII., 88. Stev. Brit. Fung. II., 281.

Broadly effused, fleshy, fragile, pallid, then yellowish, at length olivaceous brown, circumference mucedinous, white; hymenium powdery, spores tawny olive, $14-16 \times 8-9\ \mu$.

On bark and wood. Common.

var. **cellaris**, Sacc.

Spores olive-brown, $10-12 \times 7-8\ \mu$.

On bark, &c., in conservatories.

- 4. Coniophora cinnamomea** (Pers.). Massee, Stev. Brit. Fung. II., 276.

Effused, confluent and irregular, adpressed, cinnamon, beneath and circumference fibrillosely strigose; hymenium fleshy, soft, cf

the same colour, cracking when dry ; spores ellipsoid, apiculate at the base, very pale cinnamon, $12 \times 8 \mu$.

On wood and bark.

5. *Coniophora umbrina* (All. and Schw.) Massee. *Stev. Brit. Fung.* II., 282.

Effused, fleshy, soft, umber, villous beneath, circumference shortly radiating, of the same colour ; hymenium tuberculose, then collapsing, powdered with ferruginous ; spores ellipsoid, apiculate at the base, pale umber, $12-14 \times 8-10 \mu$.

Effused on wood, branches, &c.

6. *Coniophora incrustans*. Massee *Linn. Journ.*

Effused, thin, indeterminate ; hymenium subtomentose, pallid ; spores very pale ochre, $15-17 \times 8-10 \mu$. (*Herb. Berk.*)

Running over leaves and twigs. Apethorpe.

7. *Coniophora arida* (Fr.). Cke. *Grev. VIII.*, 89. *Stev. Brit. Fung.* II., 282.

Membranaceous, effused, closely adnate, thin, margin radiately byssoid, whitish ; hymenium even, sulphur-coloured, then powdery, umber becoming rusty : spores ellipsoid, apiculate at the base, ochraceous, $12 \times 7 \mu$.

On pine wood.

8. *Coniophora sulphurea* (Fr.). Massee. *Cooke Handbk. No.* 929. *Stev. Brit. Fung.* II., 276.

Effused, fibrillose byssoid, bright sulphur coloured ; hymenium (when perfect) thick, tawny, waxy and soft, cracking when dry ; spores ellipsoid or subglobose, yellow-brown, $12 \times 9 \mu$.

On wood, &c.

var. *ochroidea*, Berk.

Spores ellipsoid, apiculate at the base ; olive, $16-18 \times 9-10 \mu$.

On wood and bark.

9. *Coniophora subdealbata* (Berk. & Br.). Massee.

Effused, determinate ; hymenium ochraceous-olive, powdery ; spores ellipsoid, apiculate at the base, ochraceous, $12 \times 8 \mu$.

On bark.

10. *Coniophora Berkeleyi*, Massee, *Linn. Journ.*

Effused, thick, determinate ; hymenium brown, at length turning purplish, cracked, interstices silky ; spores ellipsoid, apiculate at the base, tawny, $12 \times 8 \mu$.

On decorticated wood.

B. MICROSPORÆ. Spores minute ($4-10 \mu$ long).

11. *Coniophora Cookei*, Massee, *Linn. Journ.*

Effused, fibrillose membranaceous, margin byssoid, pallid ; hymenium ferruginous olive, powdery ; spores elliptic, ochraceous, $10 \times 6 \mu$.

On rotting wood.

12. Coniophora ochracea, *Massee, Linn. Journ. t. 47, f. 13.*

Very broadly effused, somewhat membranaceous, indeterminate; hymenium powdery, ochraceous; spores yellowish, subglobose, $8 \times 6-7 \mu$.

Spreading continuously over the inside of elm bark. Kew.

13. Coniophora membranacea (*D.C.*). *Cooke Grev. VIII., 89. Sow. Fungi t. 214.*

Somewhat orbicular, or effused, rather membranaceous, fragile, margin fibrillose, yellowish; hymenium dingy ferruginous, powdery; spores elliptical, brownish-yellow, $10-15 \times 5-6 \mu$.

Forming thin patches on walls, &c.

GEN. 2. **PENIOPHORA.** *Cooke Grev. VIII., 20.*

Resupinate effused; hymenium setulose, setæ (or cystidia) hyaline, verruculose, fusiform; spores white, hyaline.

A. *Margin free, more or less reflexed.***1. Peniophora quercina** (*Fr.*) *Cooke Grev. VIII., t. 125, f. 13.*

Between cartilaginous and membranaceous, at first adglutinate, then with the centre fixed, elsewhere separated, and at length involute, rigid, smooth beneath and turning black; hymenium flesh colour; cystidia fusoid, $50-70 \times 15-20 \mu$. Spores oblong ellipsoid, curved, $13-15 \times 5 \mu$.

On oak branches, etc. Common.

2. Peniophora pezizoides, *Massee Mon. Thel. p. 141, t. 47, figs. 17-19.*

Somewhat leathery, cup-shaped, then flattened, fixed at the centre, externally pallid villous; hymenium ochraceous, velvety, continuous; cystidia fusoid, but with the apex rounded, acute at the base, $50-60 \times 20 \mu$. Spores globose, $4-5 \mu$.

On horse-chestnut branches. Kew.

3. Peniophora gigantea (*Fries.*) *Massee Mon. Thel. p. 142. Corticium giganteum, Handbk. 922. Stev. Br. Fung. II., 274.*

Very broadly effused, swelling when moist, waxy, hyaline-white, cartilaginous when dry, papery, free, milk white, margin strigose radiating; hymenium even, continuous, velvety; cystidia fusoid, $50-60 \times 20-30 \mu$. Spores ellipsoid, $10 \times 5-6 \mu$.

On bark and wood of fir.

B. *Margin adpressed, often indeterminate.***4. Peniophora limitata** (*Mont.*) *Cooke Grev. VIII., t. 123, f. 7.*

Somewhat orbicular, closely adnate, grumous, indurated, smooth, lurid, becoming pale; margin limited by a black line; hymenium very delicately velvety; cystidia fusoid, $30-40 \times 15-20 \mu$. Spores oblong-ellipsoid, slightly curved, apiculate at the base, $20-22 \times 6 \mu$.

On bark and wood.

- 5. *Peniophora rosea* (Pers.).** *Massee Mon. Thel.* p. 146. *Handbk. No.* 926. *Stenson Brit. Fungi.* II., 275.

Effused, adnate, rose-colour, margin fimbriate whitish; hymenium delicately velvety, growing pale, at length corrugated and cracked; cystidia fusoid, $40-60 \times 20-30 \mu$. Spores oblong-ellipsoid, curved, $13-15 \times 4-5 \mu$.

On wood and bark.

- 6. *Peniophora incarnata* (Fr.).** *Massee Mon. Thel.* p. 147. *Handbk.* No. 938. *Stev. Br. Fungi* II., 227.

Somewhat waxy, adglutinate, indeterminate, margin radiating; hymenium persistently bright coloured (red, orange), velvety with short setæ; cystidia fusoid, $25-30 \times 15-20 \mu$. Spores oblong-ellipsoid, curved, apiculate at the base, $20 \times 5-6 \mu$.

On wood and bark.

Cystidia much exserted, soon falling away, leaving the hymenium smooth.

- 7. *Peniophora cinerea* (Fries).** *Cooke Grev.* VIII., t. 123, f. 8. *Handbk. No.* 937. *Stev. Brit. Fungi* II., 279.

Waxy, then becoming rigid, confluent, cinereous or lurid, margin similar; hymenium delicately velvety, cystidia fusoid, $30-50 \times 20-25 \mu$. Spores globose, $5-7 \mu$.

On wood and bark.

- 8. *Peniophora pubera* (Fries).** *Massee Mon. Thel.* p. 149. *Stev. Brit. Fung.* II., 277.

Broadly effused, closely adnate, indeterminate, white or clay-coloured; hymenium even, velvety with short setæ, cracking when dry; cystidia cylindrically fusoid, $80-120 \times 15-20 \mu$; spores oblong-ellipsoid, $10-12 \times 4 \mu$.

On wood or bark.

- 9. *Peniophora ochracea* (Fries).** *Massee Mon. Thel.* p. 150. *Handbk.* No. 635. *Stev. Brit. Fung.* II., 278.

Broadly effused, margin white, somewhat radiating, soon vanishing; hymenium pallid ochraceous, sprinkled with scattered shining golden atoms, at length naked, when dry cracked; cystidia fusoid, $40-50 \times 20 \mu$; spores ellipsoid, $10 \times 5 \mu$.

On bark, wood, &c.

- 10. *Peniophora scotica*,** *Massee Mon. Thel.* p. 152.

Broadly effused, margin fibrillosely radiate; hymenium cinnamon, velvety; cystidia somewhat cylindrical, $80-120 \times 15-20 \mu$; spores ellipsoid, $8-10 \times 6-7 \mu$.

Broadly effused over the inside of bark. Scotland.

- 11. *Peniophora velutina* (Fr.).** *Cooke Grev.* VIII., t. 125, f. 15. *Handbk. No.* 927. *Stev. Brit. Fung.* II., 275.

Broadly effused, adnate, flesh-coloured, margin strigose with divergent straight fibres of the same colour; hymenium even, velvety with dense setæ; cystidia cylindrically fusoid, $60-80 \times 10-15 \mu$; spores ellipsoid, apiculate at the base, $10 \times 15 \mu$.

On wood and bark.

When well developed of a pale cream-colour, tinged with pink; often pallid.

12. *Peniophora rimosa*, Cooke Grev. IX., 94.

Broadly effused, adglutinate, indeterminate; hymenium ochraceous delicately velvety, cracking into areolæ, interstices silky; cystidia fusoid, $70-100 \times 15-18 \mu$; spores oblong-ellipsoid, obtuse at each end, slightly curved, $15-17 \times 6 \mu$.

On bark and wood.

13. *Peniophora terrestris*. Massee Grev. XV., p. 107.

Effused, very thin, cinereous, or pallid fawn colour, indeterminate; hymenium velvety; cystidia cylindrically fusoid, $85-90 \times 15-20 \mu$; spores ellipsoid, $10 \times 6-7 \mu$.

On naked soil and dead leaves.

C. *Sub-Gen.* SCOPULOIDES; *cystidia aggregated in fascicles.*

14. *Peniophora hydroides*, Cooke & Massee Mon. Thel. 154, t. 47, figs. 15, 16.

Broadly effused, thin, rather innate, indeterminate; hymenium cinereous; cystidia cylindrically fusoid, $70-120 \times 12-14 \mu$; spores globose, $4-5 \mu$.

On bark. Carlisle.

GEN. 3. **HYMENOCHÆTE**, *Ler.*

Pileus coriaceous, membranaceous, variable in form. Hymenium furnished with minute rigid persistent setæ. Basidia tetrasporous. Spores white or olive.

I. STIPITATÆ. *Having a definite stem.* No British species.

II. APODES. *Spores white, setæ acuminate.*

**1. *Hymenochæte rubiginosa*, *Ler. Ann. Sci. Nat. Ser. 3, v. 121.*
*Cooke Grev. VIII., 145. Stev. Brit. Fung II., 269.***

Coriaceous, rigid; pileus effused, reflexed, somewhat imbricate, velvety, reddish-brown, then becoming smooth, bay-brown, intermediate stratum tawny-ferruginous; hymenium ferruginous; setæ acutely conical, or rather obtusely cylindrical, $80-100 \times 5-8 \mu$; spores ellipsoid, $5 \times 3 \mu$.

On hard wood, posts, etc.

2. *Hymenochæte avellana* (Fries). *Cooke Grev. VIII., 146. Stev. Brit. Fung II., 270.*

Coriaceous, hard; pileus effused, margin obtuse, free, narrowly reflexed, bay-brown, villous; hymenium even, velvety or pruinose, or becoming smooth, pale ferruginous (here and there bleeding); setæ cylindrical, rather obtuse, $80-140 \times 7-9 \mu$; spores cylindrically ellipsoid, $6-7 \times 3 \mu$.

On hazel, beech, etc. Appin.

III. RESUPINATÆ. *Pileus resupinate.*

† *Spores white, setæ acuminate.*

3. *Hymenochæte nigrescens*, *Cooke in Herb. Kew. Massee. Mon. Thel. 104, t. 5, f. 5.*

Pilei peltate, flattened, solitary or gregarious, or confluent, rigid, margin free, a little reflexed; hymenium setulose, brownish, turn-

ing black ; setæ conical, becoming blackish, $80-140 \times 10-12 \mu$; spores ellipsoid, $10 \times 5 \mu$.

On dry wood. Carlisle.

- 4. Hymenochæte Stevensoni**, *Berk. & Br. Ann. Nat. Hist.* 1879, p. 211. *S. rufohispidum*. *Stev. Brit. Fung.* 269.

Pallid fawn colour, rigid ; margin obtuse, elevated ; setæ rigid, $20-40 \times 8-10 \mu$. Spores elliptically fusoid, $6-7 \times 3-4 \mu$.

On yew. Dunkeld or Glamis, N.B.

- 5. Hymenochæte leonina**, *Berk. & Curt. Massee Mon. Thel.* 107.

Wholly resupinate, ferruginous, saffron colour ; margin tomentose ; hymenium unequal, inseparable, not cracking ; setæ acuminate, thick, $20-30 \times 12-15 \mu$. Spores subglobose, $6 \times 5 \mu$.

On dead wood.

- 6. Hymenochæte fuliginosa**, *Lev. Grev. VIII.*, 147. *Mass. Mon. Thel.* p. 109.

Effused, coriaceous, compact, dark fuliginous bay-brown ; hymenium even ; setæ dense, sometimes scattered, $30-50 \times 6-8 \mu$; spores subglobose, $5 \times 4 \mu$.

On wood.

†† *Spores olive.*

- 7. Hymenochæte corrugata**, *Lev. Ann. Sci. Nat.* v., 152. *Stev. Brit. Fung.* II., 280. *Cooke Handbk.* No. 918.

Somewhat effused, closely adnate, soon grumous ; pallid cinnamon ; hymenium beset with ferruginous setæ, when dry much cracked ; setæ conical, acuminate, $70-120 \mu$; spores ellipsoid, olivaceous, $7-8 \times 4-5 \mu$.

On bark, etc.

- 8. Hymenochæte croceo-ferruginea**. *Massee Mon. Thel.* p. 110, t. 5, f. 9.

Effused, broadly incrusting, very thin, ferruginous, saffron colour, becoming tawny ; hymenium very minutely setulose, cracked ; setæ cylindrical, inflated at the base, $70-100 \times 30-35 \mu$; spores subglobose, olive, $7 \times 6 \mu$.

On dead stem of *Rosa canina*. Apethorpe.

- 9. Hymenochæte tabacina**, *Lev. Cooke Grev. VIII.*, 145 ; *Handbk.* No. 917.

Somewhat coriaceous, thin, flaccid ; pileus effused, reflexed, silky, at length smooth, rather ferruginous, margin and intermediate stratum filamentose, golden yellow ; hymenium paler, pubescent with setæ, which are conical acuminate, $80-130 \times 10-14 \mu$; spores ellipsoid, olive, $5-6 \times 3 \mu$.

On trunks, etc.

††† *Setæ subclavate, sometimes rough.*

- 10. Hymenochæte crassa**, *Berk. Cooke Grev. VIII.*, 148.

Pileus resupinate, coriaceous, tomentose, velvety, pallid rufous, margin thick, at length free ; hymenium unequal, velvety, of the

same colour; setæ conical or subclavate, sometimes rough, 70-130 \times 7-14 μ ; spores cylindrically ellipsoid, 7-8 \times 4 μ .

On trunks.

Hymenochaete Boltoni (Sacc.). *Cooke Grev.* VIII, 145.

Has been supposed to be British, but there is no reliable evidence.

MEMORABILIA.

HYPOXYLON BROOMEIANUM, *Berk. & Curt.*—The specimens named *Hypoxylon amorphum*, *Ell. & Ev.*, are typical *H. Broomeianum*, *Berk.*, according to authentic specimens.

POLYSTICTUS PERADENIÆ, *B. & Br.*—According to authentic specimen the *Polyporus chrysoleucus*, *Kalchbrenner*, is no other than the above species.

POLYSTICTUS LUTEO-OLIVACEUS, *Berk.*—Specimen of *Polyporus placodes*, *Kalchbrenner*, believed to be genuine is certainly the above species of *Berkeley*.

VALSA PLATANI, *Schwein. Syn. Amer. Bor.*, 1372.—Sporidia eight, allantoid, hyaline, 10 \times 2 μ . From specimen communicated to M. J. *Berkeley* by Dr. M. A. *Curtis*.

FUNGI SCANDINAVICI.—Mr. Lars Romell has issued his first century of dried specimens of Scandinavian Fungi, neatly got up, but unfortunately in the modern style, with the specimens loose in pockets. Nicely they will be mixed up in public herbaria in a few years. Of course everybody will return them to the wrong pockets. They always do. The only trustworthy exsiccati will then be those in which the specimens are permanently glued down.

FUNGUS FORAYS, 1890.—Up to the time of going to press arrangements had not been completed for the dates of the Fungus Forays this year, on account of the uncertain state of the weather. The Cryptogamic Society of Scotland has fixed its sixteenth conference for the 23rd of September at the Boat of Garten (Station on Highland Railway), and following days. The Essex Field Club propose to go outside Epping Forest this year, and explore other woods in the county. The Woolhope Club will occupy the usual first week in October, but definite programme has not yet been arranged. Again the Hampshire Naturalists are projecting a raid in the New Forest, but beyond these we have, as yet, no intimation. In due time we presume that those who customarily take part in these gatherings will receive private notice.

AUSTRALIAN FUNGI.—Efforts have been made during the past year or two, and are still being made, to arrange for the production of a Handbook of the Fungi of the Australian colonies, with short descriptions of the genera and species in English, and illustrations of the genera. The want of such a work has long been felt, but the difficulty has been in securing some guarantee against personal pecuniary loss. Present prospects are somewhat

favourable to the hope that the several Governments will combine in active patronage, and that some arrangement will be made for carrying this project into execution, despite the difficulties which have hitherto presented themselves. It is probable now that such a work will be fairly on the way in the coming year.

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Grevillea.

A QUARTERLY RECORD OF CRYPTOGAMIC BOTANY
AND ITS LITERATURE.

BRITISH THELEPHOREI.

(Continued from p. 21.)

GEN. 4. **CORTICIUM.** *Fries.*

Hymenium amphigenous, even or tuberculose, waxy, smooth, arising immediately from the mycelium without an intermediate stratum; spores white.

A. *Margin free, determinate, marginate.*

1. **Corticium salicinum** (*Fr.*). *Stev. Brit. Fung.* II., 273.

Coriaceous, soft, rigid when dry, fixed by the centre, margin everywhere reflexed, externally white villous; hymenium persistently blood red, continuous when dry; spores cylindrical-ellipsoid, curved, $14-16 \times 5-6 \mu$.

On willow, rarely on poplar. Kinrara, N.B.

2. **Corticium evolvens** (*Fr.*). *Cooke Handbk. No. 921. Stev. Brit. Fung.* II., 273.

Resupinate, marginate or effuso-reflexed, soft, covered beneath with a whitish flocculose tomentum, not zoned; hymenium naked, smooth, rather rugose, tawny growing pale, cracking when dry; spores ellipsoid, $10-12 \times 5 \mu$.

On bark, especially cherry. King's Cliff. Batheaston. Dangstein, Warwick. Glamis. Forres, N.B.

3. **Corticium porosum**, *Berk. & Curt. Ann. Nat. Hist. No. 1821. Stev. Brit. Fung.* II., p. 275.

Resupinate, milk white, here and there porous, margin free, reflexed; spores oblong-ellipsoid, $7 \times 4 \mu$. ("The pores look as if little dewdrops had settled on the hymenium, which had in consequence contracted.")

On wood. Aboyne.

4. **Corticium populinum**, *Fr. Hym. Eur.* 648.

Soft, tuberculiiform, soon confluent and effused, at length involute, marginate, whitish tomentose beneath; hymenium uneven, ferruginous-cinereous; spores subglobose $7-8, \mu$

On poplar. Scarboro.

5. *Corticium lycii* (Pers.) Cooke Grev. ix., 95.

Effused, thin; margin pallid, free, somewhat byssoid; hymenium lilac, continuous; spores ellipsoid, $8 \times 4 \mu$.

On *Lycium* and *Syringa*. Kew.

***Corticium Boltoni*, Fries, *Massee Mon. Thel.* 123.**

This is undoubtedly the same thing as *Hymenochaete Boltoni*, Sacc., referred also to Bolton's t. 166, fig. d. But the whole evidence of its being British depends on this figure.

B. *Immarginate, margin and substratum byssoid or strigose.*

* *Hymenium white, or ochraceous.*

6. *Corticium calceum*, Fr. *Hym. Eur.* 652. *Handbk.* No. 933. *Stev. Brit. Fung.* II., 277.

Broadly effused, adglutinate, waxy, quite smooth, white, margin similar; hymenium even, cracked when dry, pallid; spores cylindrically ellipsoid, $8 \times 4 \mu$.

On wood. Common.

Cort. cretaceum, Pers., does not appear to be specifically distinct.

7. *Corticium serum*, Fr. *Hym. Eur.* 652. *Stev. Brit. Fung.* 283.

Broadly effused, incrusting, thin, white, fleshy when recent, smooth, pruinose, then dry and flocculose and splitting, with crowded rounded equal papillæ; spores ellipsoid, $12-15 \times 8-9 \mu$.

On wood. Epping. Glamis. Menmuir. Maidenhead.

8. *Corticium sebaceum* (Fr.). *Massee Mon. Thel.* 127. *Handbk.* No. 904. *Stev. Brit. Fung.* II., 265. *Sebacina incrustans*, Tulasne.

Effused, between fleshy and waxy, becoming hard, incrusting and variable in form, tuberculose or stalactitic, whitish, margin similar; hymenium collapsing, flocculose pruinose; spores ellipsoid, apiculate at the base, $14-16 \times 7-9 \mu$.

On the ground, or running over grass, twigs, &c. Not uncommon.

9. *Corticium scutellare*, Berk. & Curt. Grev. II., p. 4. *Stev. Brit. Fung.* II., 278.

Resupinate, broadly effused, immarginate, whitish then somewhat tan coloured; hymenium cracking into minute areolæ; spores ellipsoid, $5 \times 3 \mu$.

On wood and herb stems. Strachan, Glamis, N.B. Carlisle.

10. *Corticium fœtidum*, Berk. & Broome Ann. Nat. Hist. No. 1824. *Mass. Mon. Thel.* p. 131, t. 6, f. 3. *Stev. Brit. Fung.* II., 275.

Strong scented, effused, resupinate, arachnoid beneath, white, then ochraceous, smooth; spores ellipsoid, $7 \times 4 \mu$.

On sawdust. Coed Coch.

11. *Corticium lacteum*, Fr. *Hym. Eur.* 649. *Handbk.* No. 923. *Stev. Brit. Fung.* II., 274.

Broadly effused, somewhat membranaceous, milk white, substratum and margin loosely fibrillose (often radiating in long thick

mycelial strands, in a frondose manner), hymenium waxy, when dry cracking and parting, pallid ochraceous; spores subglobose, 5-6 μ .
On wood. Sherwood Forest.

12. Corticium læve, *Fr. Hym. Eur.* 649. *Handbk. No.* 925. *Stev. Brit. Fung. II.*, 275.

Effused, membranaceous, separating from the matrix, substratum villous, circumference byssoid (not fibrillosely radiate); hymenium even, smooth, somewhat flesh colour or livid; spores ellipsoid, $7 \times 5 \mu$.

On wood, bark, &c. Common.

13. Corticium nudum, *Fr. Hym. Eur.* 655.

Waxy, adglutinate, cracking, flesh-colour, then pale; margin determinate, smooth; hymenium even, cracking when dry, clad with a fugacious white meal; spores ellipsoid, $8 \times 5 \mu$.

On bark. Carlisle.

14. Corticium confluens, *Fries Hym. Eur.* 655, *Handbk. No.* 940. *Stev. Brit. Fung. II.*, 279.

Adglutinate, somewhat membranaceous; margin radiating (not fibrillose); hymenium even, naked, hyaline, becoming white when dry; spores cylindrically ellipsoid, $20 \times 10 \mu$.

On bark, usually beech. Sibbertoft.

15. Corticium arachnoideum, *Berk. Ann. Nat. Hist. No.* 287. *Handbk. No.* 924. *Stev. Brit. Fung. II.*, 275.

Thin, effused, pallid, immarginate, fibrillose or rather floccose beneath, margin fimbriate with white fibrils; hymenium waxy, continuous, here and there cracked when dry; spores globose, 6-7 μ diam.

On wood, bark, &c. Common.

16. Corticium typhæ, *Fekl. Symb. Myc. p.* 27. *Stev. Brit. Fung. II.*, 281.

Longitudinally effused, thin, at first forming spots, which are white and byssoid, smooth, then mealy, tan coloured; spores ellipsoid, $6 \times 3-4 \mu$.

On dried leaves of *Typha* and *Carex*. N. Wootton.

17. Corticium epiphyllum (*Pers.*). *Wallr. Crypt. Germ. No.* 1982.

Very thin, smooth, irregularly effused, margin indeterminate, wholly whitish, becoming cinereous.

On dead oak leaves. Shrewsbury. Badminton.

18. Corticium sambuci, *Fries Hym. Eur.* 660. *Handbk. No.* 943. *Stev. Brit. Fung. II.*, 283.

Broadly effused, indeterminate, rather innate, encrusting, ambient, white; when dry flocculose and collapsing; spores ellipsoid, $8-10 \times 5-6 \mu$.

On *Sambucus*. Common.

- 19. *Corticium lactescens*, Berk. Outl. p. 274. Handbk. No. 932.**
Stev. Brit. Fung. II., 276.

Between soft and waxy, adglutinate, undulate, pale flesh coloured, when wounded exuding a watery milk, margin byssoid, continuous, short; hymenium at length cracked, interstices pallid, silky; spores globose, $4\ \mu$ diam.

On ash, willow, &c. Near Hereford, Oswestry, Staunton, Bungay, Clifton, West Farley, Perth.

- 20. *Corticium lacunosum*, Berk. & Br. Ann. Nat. Hist. No. 1371.**
Stev. Brit. Fung. II., 284.

Broadly effused, soft, mycelium woolly, tawny, lacunose; hymenium ochraceous or cinnamon, waxy, continuous; spores ellipsoid, hyaline, $7 \times 4\text{--}5\ \mu$.

On wood. Aboyne, Carlisle.

- 21. *Corticium radiosum*, Fries Hym. Eur. 649.**
 = *C. radians*, B. & Br.

Rather rounded, membranaceous, adnate, adpressedly fibrillose beneath, margin fimbriate with white fibrils; hymenium even, smooth, tan coloured, continuous; spores subglobose, $5\text{--}6\ \mu$ diam.

On rotten wood. Coed Coch.

**** *Hymenium brightly coloured.***

- 22. *Corticium roseolum*, Massee Mon. Thel. 140, t. 6, f. 2.**

Very broadly effused, indeterminate, very thin; hymenium continuous, smooth, of a beautiful rose colour, becoming pale; spores subglobose, apiculate at the base, $7 \times 8\text{--}9\ \mu$.

On old worked wood. Apethorpe, Carlisle.

- 23. *Corticium aurora*, Berk. Outl. p. 276. Handbk. No. 944. *Stev. Brit. Fung. II., 281.***

Effused, very thin, adglutinate, rosy, becoming pale; margin indeterminate; spores ellipsoid, apiculate at the base, $10\text{--}11 \times 7\text{--}8\ \mu$.

On dead leaves of *Carex*. Batheaston.

- 24. *Corticium anthochroum* (Pers.). Fr. Hym. Eur. 661. Handbk. No. 909. *Stev. Brit. Fung. II., 284.***

Broadly effused, membranaceous, brick red or rosy, growing pale; margin byssoid, paler; spores ellipsoid, $11\text{--}13 \times 8\text{--}9\ \mu$.

On bark. Batheaston. Forres, N.B.

- 25. *Corticium molle*, Fries Hym. Eur. 660.**

Rather rounded, floccosely fleshy, loosely interwoven, soft, pallid, spotted with reddish, villous beneath; margin naked; hymenium waxy, papillose, cracked when dry; spores cylindrically ellipsoid, obtuse at each end, $7 \times 5\ \mu$.

On wood and bark of pine.

- 26. *Corticium polygonium*, Fries Hym. Eur. 655. Handbk. No. 941. Stev. Brit. Fung. II., 280.**

Adnate, determinate, soon indurated, rather grumous, flesh coloured, margin similar; hymenium red beneath the dense frosty meal; spores cylindrically ellipsoid, $14-16 \times 5-7 \mu$.

On bark, especially poplar. Batheaston, Somerset, &c.

Appearing under the form of dense *Tubercularia*-like pustules.

- 27. *Corticium maculæforme*, Fr. Hym. Eur. 656. Stev. Brit. Fung. 4. Fl. Dan., t. 1738, f. 2.**

Orbicular, then confluent, indurated, thin, somewhat rosy; margin similar, smooth; hymenium spuriously papillose, greyish pruinose.

On dry branches. Penzance.

- 28. *Corticium sanguineum*, Fries Hym. Eur. 650. Handbk. No. 928. Stev. Brit. Fung. II., 276.**

Broadly effused, indeterminate, loosely adherent, web-like beneath, blood-red; margin loosely fibrillose; hymenium even, smooth, flesh coloured, at length pallid; spores ellipsoid, $6 \times 4 \mu$.

On wood. Appin, Carlisle, Apethorpe. Forbes, N.B. Hereford.

- 29. *Corticium Carlylei*, Massee Mon. Thel. 148.**

Effused in elongated patches, adglutinate, between waxy and soft, smooth; margin white, soon vanishing; hymenium even, naked, dingy orange, continuous when dry; spores cylindrically ellipsoid, obtuse at the ends, curved, $18-20 \times 5-6 \mu$.

On oak bark. Carlisle.

- 30. *Corticium flaveolum*, Massee Mon. Thel. 150.**

Effused, membranaceous, loosely adhering to the matrix; margin determinate; hymenium smooth, pallid yellowish; spores cylindrically ellipsoid, obtuse at the ends, $7 \times 5 \mu$.

On trunk of tree-fern. Kew.

- 31. *Corticium cœruleum*, Fries Hym. Eur. 651. Handbk. No. 930. Stev. Brit. Fung. II., 277.**

Broadly effused, adnate, tomentose, bright blue; margin byssoid of the same colour, becoming whitish; hymenium soft, waxy, turning paler when dry; spores ellipsoid, $8 \times 4 \mu$.

On wood. Common.

- 32. *Corticium violaceo-lividum*, Fries Hym. Eur. 655. Stev. Brit. Fung. II., 280.**

Somewhat effused, adnate, indurated, livid-violet, margin paler; hymenium spuriously corrugated, tuberculose; clad with a scattered whitish meal; spores cylindrically ellipsoid, curved, $8 \times 4 \mu$.

On wood. Glamis, N.B.

- 33. *Corticium lividum*, Pers. Obs. I, p. 38. Handbk. No. 934. Stev. Brit. Fung. II., 278.**

Effused, closely adnate, between waxy and soft, variable in colour; margin similar; hymenium even, naked, rather viscid

when moist, cracking when dry ; spores cylindrically ellipsoid, 7-8 \times 4 μ .

On wood. Carlisle, Coed Coch, Glamis.

- 34. *Corticium atro-virens*, Fries Hym. Eur. 651. Handbk. No. 931. Stev. Brit. Fung. II., 277.**

Irregularly effused, thin, dark greenish ; margin and substratum tomentose, of the same colour ; hymenium waxy, smooth, pruinose with white ; spores subglobose, 4-5 μ diam.

On rotten wood, leaves, sticks, &c. Epping, Coed Coch.

C. Amphigenous, very thin, innate, throwing off the bark.

- 35. *Corticium nigrescens*, Fries Hym. Eur. 556.**

Effused, interrupted, when the epidermis is cast off naked, innate, thin, yellowish, then becoming blackish ; hymenium here and there papillose, waxy, sub-pruinose ; spores cylindrically oblong, obtuse at the ends, curved, 18-20 \times 5-6 μ .

On branches. Carlisle.

- 36. *Corticium comedens*, Fries Hym. Eur. 656. Handbk. 942. Stev. Brit. Fung. II., 281.**

Effused, innate, growing beneath the bark ; when the epidermis is cast off naked, lilac, growing pale ; hymenium even, smooth, cracking when dry ; spores cylindrically ellipsoid, often curved, 14-16 \times 6-7 μ .

On branches, especially hazel. Common.

CONTROVERTED AGARICS.

By M. C. COOKE.*

The practical completion of the "Illustrations of British Fungi" affords me an opportunity, and an excuse, for a few brief observations on some of the species which are open to discussion. It seems to me not of so much consequence whether any distinct form of Agaric should be called a species, or only a variety, as it is to have a definite name by which such a form, or variety, or species, can be distinguished, and a true and faithful figure to which reference can be made. Notwithstanding this, it cannot be an advantage to science that species should be called by names which assume that the plants represented are the same as those which have been described by older authors under such designations. It may be that I have not always been wholly free from error myself, but wherever such is shown to be the case, I am ready to retract, since I know that to "err is human," and during the course of this paper I shall not hesitate to express my doubts frankly, and

* Paper read at the Woolhope Naturalists' Field Club, September 30th, 1890.

give the benefit of the doubt to those who may have disputed my views.

It is not my intention, nevertheless, to give way recklessly on points which have given me much cause for consideration, and on which the evidence as yet adduced is insufficient to raise a doubt in my own mind. Such, for instance, is the case with *Tricholoma russula* and *Hygrophorus erubescens*, as well as *Russula delica* and *Lactarius exsuccus*. In both these cases, although prepared to treat with respect views opposed to my own, I am not convinced.

There is, however, a rather important instance in which I am inclined to modify considerably. In the *Scottish Naturalist*, July, 1890, the Rev. Dr. Keith writes of *Agaricus storea*, Fr., as follows:—

“This fungus has got itself established in our books as a species which has been found both in England and Scotland; but though I have frequently met with the plant which has been going by this name among British mycologists, I have never been able to satisfy myself as to its identity with Fries’ species. *Ag. storea* is recorded and described in three of Fries’ works—his ‘*Epicrisis*’ (1836-38), his ‘*Monographia*’ (1857), and his ‘*Hymenomycetes Europæi*’ (1874). In each of these it is expressly mentioned that he had found it only twice, in 1815 and 1833, and on both occasions on the same trunk. As regards his acquaintance with the species, therefore, all three works are of equal value, for he had never met with it after describing it in the ‘*Epicrisis*.’ Indeed, the description in the ‘*Hymenomycetes*’ is a verbatim translation of that in the ‘*Epicrisis*,’ so that I am inclined to regard the description in the ‘*Monographia*’ as his latest independent account of the species. Now in that description it is expressly declared to be a solitary growing species, a feature which is emphasized by being printed in italics, and which is said to remove it far from other species otherwise approaching it closely. On the other hand, the fungus which has been passing among us as *Ag. storea*, Fr., is a remarkably caespitose one, diverging in this respect very strikingly from the habit of the true plant. Stevenson, in his ‘*British Fungi*,’ gives Fries’ description of the species with his usual accuracy, and mentions two habitats Ascot and Perth fungus show. I know nothing of the Ascot specimens, but those which occurred at Perth were growing in large clusters, and it was there I got, from a distinguished English mycologist, the name of *Ag. storea*, Fr., for a fungus which I had previously taken for *Ag. lacrymabundus*, Fr. Cooke cuts the knot of the difficulty by calling it *Ag. storea*, Fr., var *caespitosus*, C. But let anyone compare the figure which he so designates with that which he gives of *Ag. lacrymabundus*, Fr., and, excepting the slight difference of colour, he will find little to distinguish them. The conclusion I am inclined to come to is that my original idea was correct, and that the fungus which has been taken for *Ag. storea*, Fr., is only a form, and scarcely entitled to be called a variety of *Ag. lacrymabundus*, Fr.”

Before making any observations on the foregoing, I must testify my profound respect for the opinions of Dr. Keith on matters relating to the Hymenomycetes, my ready acknowledgment of his great experience in field work, and a full recognition of his careful and acute powers of observation. No opinion which I have heard on this vexed question has come to me with an equal degree of force, and I must acknowledge myself, if not entirely, yet to a very large extent, ready to accept his interpretation.

The first record of this name amongst British Fungi was by Berkeley and Broome in the "Annals of Natural History," No. 1418, with the remark: "This curious species occurred last year at the base of different trees at Ascot and at Coed Coch; and it has also been found by Mr W. G. Smith, and was exhibited at South Kensington, October, 1873. It is considered very rare by Fries; but it is probably one of those species which are abundant in some one year, and are not found again for a generation." W. G. Smith figured his specimens in the *Journal of Botany*, Vol. xiv., Plate 176, Fig 4. There remains no doubt that the species seen by Berkeley, and found by Smith, were the same as that figured in "Illustrations of British Fungi," Plate 543, and again, the same as that alluded to by Dr. Keith as exhibited at Perth. Of the identity of all these there need be no question. Berkeley and Smith had the same plant in view, for both have indicated it to me as *Ag. storea*, Fr., and gave me the first impression of the species.

In 1884 Mr. C. B. Plowright gave expression to his views on this species in "Grevillea," Vol. xiii., p. 48, where he described it under the name of *Ag. hypoxanthus*, adding: "This Agaric has been regarded as *A. storea*, but incorrectly so. It is always cæspitose,* and has hitherto occurred either on rotten beech wood or under beech trees." I was still under the impression that it was a cæspitose condition of *Ag. storea* when it was figured as *Ag. storea* var *cæspitosus* in "Illustrations of Fungi," Plate 543, and I was much influenced by the opinion of the Rev. J. Berkeley in its favour.

Upon careful consideration of the subject, I have come to the conclusion that we really know nothing of *Ag. storea* beyond the description in Fries. There is no figure of it in existence, as far as we know, and we have nothing to guide us but a strict adherence to the description given by Fries. The plant under consideration does not conform in all particulars to the description; it cannot be the typical form; and it seems to me that I am not justified in insisting upon the retention of a variety, the type of which is comparatively unknown. I think that the points of divergence insisted upon are its cæspitose habit, moist viscid pileus, and hollow stem, and I doubt if the edges of the gills are alboserrulate. I cannot recognize the habit of *Inocybe* ("habitus

* This present year (1890) I have found precisely the same species growing *solitary*, so that it is not always cæspitose.—M. C. C.

potius *Inocybes*”), therefore my inference is that it is safer to revert (at least *pro tem.*) to the name *Agaricus hypoxanthus*, Plow., and dis sever it entirely from *Ag. storea*.

One other question has been raised, and it is that which I do not at present see my way to accept, that this is a form of *Agaricus lacrymabundus*, Fr. I have not recognized the “weeping gills,” and for the time being will pass it by as an “open question.”

I must be permitted to relieve my mind a little in reference to three or four closely similar forms to each other which have hitherto borne distinctive names, but which I am beginning to think do not deserve that honour. This group includes, as we know them, *Agaricus (Nolanea) pisciodorus*, Cesati (illustr., 378, Fig. A), *Ag. (Nolanea) piceus*, Kalch (illustr., 379, Fig. A), *Ag. (Naucoria) cucumis*, Pers. (illustr., 452), and *Ag. (Nolanea) nigripes*, Trog (illustr., 1,170).

It is noteworthy that all these four species are characterized as having a strong odour as of putrid fish or cucumber. Perhaps it may be assumed that the odour is the same, whatever it may be said to resemble. In the next place, three are referred to *Nolanea* and one to *Naucoria*. I am not disposed to place much reliance upon the presence of one in *Naucoria* as evidence. It is not easy to detect amber-coloured spores from salmon-coloured spores, and as all have apparently elliptical smooth spores of nearly the same size, at least in three out of four, the size and form of spores will not help us, and I doubt much whether the *Ag. cucumis*, with which we are acquainted, may not be as much *Nolanea* as *Naucoria*. At any rate, I should be quite prepared for such a revelation. Then, again, all of them have black, or nearly black, stems, not a common event with slender-stemmed Agarics. Say what we will, there is a suspiciously close alliance between all the species, and if we take the trouble to compare the respective diagnoses of all the four, we shall be no nearer the discovery of good marks of specific difference than by a comparison of the figures. If we strike out from all simultaneously the features in which they coincide, there will be very little left.

A. nigripes, Trog. Fr. Hym. Eur., No. 752.

Pileus submembranaceous, conic then campanulate, obtuse, without striæ, covered with paler flocci, brown, stem fistulose, twisted, smooth, black; gills nearly free, thin, ventricose, yellow flesh-colour. Smell as of putrid fish. Stem often bent, tough, four to five inches long. Pileus 1½ in. broad. In swamps.

A. pisciodorus, Cesati. Fr. Hym. Eur., No. 753.

Pileus submembranaceous, conic then campanulate then convex, obsoletely umbonate, velvety and soft, fulvous-cinnamon; stem subfistulose, tough, delicately pruinose, chestnut turning blackish, paler at the apex, rather velvety; gills slightly adnexed, gilvous then flesh-colour, at length fulvous. Odour similar to *A. nigripes*, but colour different. On chips and rotten leaves. Spores ovoid-oblong.

A. piceus, Kalch. Fr. Hym. Eur., 761.

Pileus submembranaceous, conic then campanulate, papillate, without striæ, smooth, pitch-colour, umber when dry; stem fistulose, rather tough, short, even, delicately pruinose, of the same colour; gills emarginate, with a decurrent tooth, ventricose, rather distant, white then flesh-coloured. Odour of cucumber, or fish. In grassy places in moist woods. Spores $10-12 \times 4$.

Ag. cucumis, Pers. Fr. Hym. Eur., 949. Sacc., 3410.

Pileus rather fleshy, broadly campanulate, smooth, fuscous bay when moist, paler about the margin; stem thin, firm, smooth, fuscous turning black, thickened at the apex, hollow, pruinose; gills slightly adnexed, ventricose, pallid then saffron-yellow. Odour of cucumber. Pileus lin. broad, but occurs smaller. Amongst chips. Spores $9-10 \times 5-6$.

The following is the condensed form which the descriptions would take if reduced to one species:—

Agaricus (Nolanea) nigripes, Trog.

Pileus submembranaceous, conic then campanulate, obtuse, without striæ, floccose or velvety, brown: stem fistulose, straight or flexuous, becoming black, smooth, sometimes pruinose and paler at the apex. Gills adnexed, nearly free, thin, ventricose, gillous then flesh-colour. Smell of putrid fish or cucumber.

(a) *Typica*. Stem flexuous, wholly black, pileus clad with paler flocci. In swamps.

(b) *Pisciodorus*. Stem straight, pruinose, paler at the apex, rather velvety; gills becoming fulvous. Spores ovoid-oblong. Pileus fulvous-cinnamon. On chips.

(c) *Cucumis*. Stem straight, pruinose, firm, thickened above. Pileus smooth, fuscous-bay when moist, paler at the margin; gills pallid then saffron yellow. Spores $9-10 \times 5-6$. On chips.

(d) *Piceus*. Stem short, straight, thicker than in the type, pruinose. Pileus papillate, pitchy brown when moist, umber when dry, paler at the margin; gills emarginate with a decurrent tooth, white then flesh-colour. Spores $10-12 \times 4$. In moist grassy places.

It must be observed that the only one of these forms which departs from the type in any feature which would warrant specific distinction is the last, which is the only truly aberrant form, in virtue of the robust stem, papillate pileus, and emarginate gills.

If I might venture an opinion, based on the belief that *Ag. cucumis* is not really a good *Naucoria*, but rather a *Nolanea*, I should suggest that *Agaricus nigripes*, *pisciodorus*, and *cucumis* are varieties of one species, call it by whatever name you please, and that *Ag. piceus* has distinctive features which might warrant its retention as a fairly-good species. At any rate, it is an open question, which merits investigation in the light of these suggestions.

Another question of doubt often presents itself to my mind in

connection with *Ag. (Clitocybe) odorus*. Fries maintains the *Ag. viridis* of Withering, and Bolton's figures (tab. 12), as a distinct species under the name of *Ag. viridis*, but as far as British Fungi are concerned, I feel satisfied that we have only the one species, which is known to us as *Agaricus odorus*, and, if there is another species, which Fries himself had never seen, it is neither that of Withering nor Bolton, and should have no place in the British list, except as synonymous with *Agaricus odorus*. As far as France is concerned, Dr. Quelet does not recognize two species, and I am strongly of opinion that at least the two references to Withering and Bolton, under *Ag. viridis*, should be transferred to *Agaricus odorus*, to which, in my opinion, they alone belong.

As this communication will be interpreted in some sense as a confession of sin, a little justification of that view may be found perhaps in the admission that I feel very suspicious of having fallen into error with regard to *Ag. (Collybia) tuberosus* and *Ag. cirrhatus*. It is at least probable that the colour of tuber is only a question of age, and that what I have figured as two species, are really but one, and that one *Agaricus tuberosus*, whilst *Ag. cirrhatus* has not been figured at all. It may be that the pale tuber is characteristic of *Ag. tuberosus*, and that the black tuber belongs to *Ag. racemosus*. Since the conviction of some error has invaded me I have had no opportunity of collecting and examining specimens so as to arrive at a definite conclusion; under any circumstances it seems that no tuber really belongs to *Ag. cirrhatus*, for some weight must be given to the remark made by Fries under the latter species, in his "Monographia": "Tuber radicale in hac specie numquam adest."

Moreover, in this place I cannot resist the impression, although I have endeavoured to view their differences impartially, that *Ag. (Clitopilus) orcella*, and *Ag. (Clitopilus) prunulus* have no just claims to specific distinction. I am well aware that our friend Dr. Bull had a strong opinion in favour of their being good species, but perhaps he only intended to express his own facility in distinguishing one form from another, and this would apply as well to mere varieties, as to definite species. It is not my intention to pronounce any dictum on what should be the limits of species or varieties, nor do I think it of so much consequence, although in this case I may be permitted to reserve a doubt, which I do not think is merely an individual opinion. I sought the most characteristic specimens for illustration, and yet I cannot recognize a sound specific difference.

Perhaps it would be considered rather heretical in me to doubt in the same manner *Ag. (Lepiota) procerus* and *Ag. (Lepiota) rachodes*, but the larger the number of specimens I examine the more are my doubts strengthened as to their specific differences.

I may observe, in reference to the "Illustrations," that Plate 49 is liable to be misleading. *Ag. (Tricholoma) murinaceus* is there

figured with white gills, but they were cinereous in my original drawing, and have been left white in printing. This was overlooked at the time, but it should be corrected. Again, Plate 167, which represents *Ag. (Tricholoma) virgatus*, has been printed with the pileus so dark that it is scarce recognizable.

I might allude to *Ag. (Tricholoma) argyraceus*. I certainly do not retain the opinion that it is a variety of the very common *Agaricus terreus*. Indeed, I cannot refer it either to *Ag. scalpturatus*, and in my present frame of mind I would rather recognize it as a species separate from either, with its two varieties, *Ag. chrysites* and *Ag. virescens*, both of which are figured in the "Illustrations." I still think that *Ag. orirubens* is only a form of *Ag. terreus*, and possibly *Ag. atro-squamosus*, but of the latter I am by no means certain.

More important, perhaps, is the conclusion I am to announce of a search after *Ag. gangrenosus*, Fr., and although I still consider it in some sense an open question, I cannot divest myself of the suspicion that we, in this island at any rate, have only *Ag. semitalis* to which all specimens and drawings of the supposed *Ag. gangrenosus* should be referred. A glance at the description as well as the figures of *Ag. semitalis* strongly suggest *Tricholoma*, and not *Collybia*, with the gills sinuate or emarginate. Possibly, also, *Ag. (Tr.) immundus* is only a pale form of *Ag. semitalis*. All of them agree in turning black when bruised, or old, and all of them should of right be placed in the same section of *Tricholoma*. Whatever we may say, the subject is at least worthy of further investigation.

Beyond dispute, I should think, since Fries has published his figures of *Hygrophorus laetus* in his "Icones," no one will contend that *Hygr. Houghtoni* can be maintained as distinct. I must profess, also, great scepticism with regard to *Bolbitius Boltoni* and *Bolbitius vitellinus*, at least if the right species have been found and figured in the "Illustrations."

Of course there are causes always at work in such cases which render some of the plates in the "Illustrations" far more satisfactory than others. The first volume, for instance, before the lithographers became accustomed to that particular kind of work, there was a deficiency in the mechanical work of printing which subsequently disappeared. The eye does not become accustomed to the nice distinctions in the tone of colour without experience, and there were difficulties at first in getting softness, and preventing exaggeration of the bright tints. These difficulties disappeared entirely by the time we arrived at *Cortinarius*, which is about the best period artistically of the work. Be that as it may, some plates will always be open to dissatisfaction, whilst others must frankly be conceded to be the best illustrations of given species ever produced in any country. The reproductions were also made from the drawings of various people beside myself, so that in some instances there is a crudeness and stiffness in drawing—and in this respect there is some variety. Some artists

never seem to acquire the power of giving character to their sketches. They may know well enough what they should be, but fail to express it. All these things taken into account, the failures are not numerous. All positive errors it has been my ambition to correct, as soon as possible, and I fancy but few are left.

It must be remembered, too, that the same species will be subject to variation, and though some of the figures are not truly typical, they, nevertheless, represent our insular forms. There is an example of this in *Agar. (Tricholoma) portentosus*; the Plate 54 has been called in question by some continental mycologists, but early this present year I found at Kew, the first time for many years, the exact form which was figured, and submitted it to one or two of my mycological friends with great satisfaction.

I have long felt that Plate 27 was a poor representation of *Ag. (Lepiota) hispidus*, Lasch, even if it deserved to be so called, but the true species was lately found at Carlisle, and is now being printed for the supplement. It has been compared with a drawing made by the illustrious Fries, and no doubt can remain of its accuracy.

Some mycologists contend that *Ag. (Lepiota) Friesii* is only a variety of *Ag. (Lepiota) acute-squamosus*, but I think that a comparison of the two figures will suffice to carry conviction that they should be maintained as distinct. Again, the identity of *Ag. (Lepiota) meleagris*, Sow., and *Ag. (Lepiota) Badhami*, Berk., it would be folly to insist upon.

The species figured on Plate 33 as *Ag. (Armillaria) aurantius* was soon found to be wrong, and it was called subsequently *Ag. robustus*, but my present opinion is in favour of *Ag. caligatus*, as figured by Barla, rather than *Ag. robustus*. In passing, it may be observed that the pileus in Plate 76 (*Agaricus acerbus*) is much too dark, and rufous. It must not be forgotten that Plate 60 is not *Ag. imbricatus*, which name is attached to it, but *Ag. vaccinus*.

A worthy friend and fellow-member of this Club is at issue with me respecting *Ag. (Clito) giganteus* and *Ag. (Clito) maximus*. I will not enter here upon the discussion, and only repeat my conviction that the two plates are accurate in their representation of the two species; therefore I have no doubt, in the course of time, my antagonist will succumb. If he is one of the first to raise doubts, and pertinacious in insisting on them, he is also most magnanimous in renouncing them as soon as he discovers that they cannot be maintained.

And here I may venture a doubt whether *Ag. (Clito) inversus*, *Ag. (Clito) flaccidus*, and *Ag. (Clito) lobatus* are not all forms of one species.

In the next place, if the figure of *Ag. (Clito) senilis*, from our late friend M. J. Berkeley, whose memory we all revere (Pl. 110), can be referred to that species at all, it must be a very remote form. It may be of interest to state that Berkeley has more than once expressed his conviction to me, that of all the

subgenera of *Agaricus* he considered *Clitocybe* as the most puzzling and difficult. Again I venture to dissent from the "Father of English Mycology," in that I have grave doubts whether his figures of *Ag. (Collybia) acervatus* (Pl. 267) represent the true species.

As to *Ag. (Collybia) balaninus*, B., and *Marasmius erythropus*, Fr., I must continue to hold to the opinion that they are by no means identical if you obtain specimens which are authentic and compare them. The *Ag. (Mycena) excisus*, figured on Plate 148, is a fine species and an interesting one, but I could not insist upon its being referred to *Ag. excisus*, of Lasch; perhaps it is a new and distinct species.

Ag. (Pleurotus) pantoleucus (Pl. 179) must, I think, be wrong in colour, but it is a faithful copy.

All I can say of *Ag. (Pleurotus) ostreatus* is that I regard it as a most variable species, and I hardly dare venture to name all the so-called species which I should characterize as some of its varieties.

Passing now from the white-spored to the pink-spored species, my first doubt is of *Ag. gloiocephalus* and *Ag. speciosus*. Is there any sound specific difference? There seems to be a much more feasible distinction between the two forms of *Ag. phlebophorus* on Plate 422, and I am inclined to give way to our Gallic neighbours who regard them as distinct species. I have already remarked elsewhere my conviction that the *Ag. (Clitopilus) carneopalbus*, of Withering, is not the species of Fries and the continental mycologists (Pl. 324).

Agaricus (Pholiota) erebius, Fr., will, I presume, be accepted as including also *Ag. (Armillaria) denigratus* and *Ag. leveilleanus*, D. & M. Amongst other species of *Pholiota* I can only allude to *Ag. comosus*, *Ag. heteroclitus*, and *Ag. destruens*, expressing my regret that I cannot find good specific differences between them. I shall purposely pass over *Hebeloma* and *Inocybe* without remark; to commence would be fatal, as the end would not be within an appreciable distance.

Leaving to private opinion, as an open question, the identity of *Ag. (Flammula) inopus* with some of the yellow species of *Hypholoma*, there is but little in *Flammula* which calls for remark. Indeed it is time that these observations came to a close. Something has already been said of *Hypholoma*, and more might be said, but for the present we will rest content with the end of the fourth volume of "Illustrations," and venture no further. To the uninitiated such a paper as this will be sufficiently uninteresting and wearisome, even if not prolonged to an inordinate extent.

Having had the effrontery to issue some 1,200 plates of these gill-bearing fungi, which has now been the persistent work of some years, with only about 12, or not more than 24 more to come, I may be excused from a desire to hold conference with the Woolhope Club on some "controverted Agarics," and unbosom some of my doubts. Some of us old friends can hardly be expected to

meet many times more; let us hope that we have each and all done something for the benefit of our successors, and that we shall leave the study of our favourite little corner in the science of botany better than we found it. Personally, I am thankful for all the encouragement and assistance which has been freely given to me by members of this Club in a long and anxious task. No one could have had more loyal and disinterested help. Had it not been for the Woolhope Club, and especially one of its most amiable and active members, whose loss we cannot cease to deplore, the "Illustrations" would never have been commenced, or brought so near to a successful close.

Upon the conclusion of this paper the Rev. Canon Du Port said:—Ladies and gentlemen,—Dr. Cooke has just told us that it was at the suggestion of some members of the Woolhope Club, and especially of him whose memory, not only in this house, but also wherever the name of Woolhope is named, is still fresh and will always be respected and loved, that he was induced to undertake the publication of his "Illustrations of British Fungi." Not only every member of the Woolhope Club, but every mycologist also, is under the deepest obligation to Dr. Cooke for the production of this unprecedented work—the illustration not of a few pet species found by himself in all stages of growth, and hence easily determined, but the illustration of every species named in the author's "Handbook" and "*quarumcunque aliarum*." The author has to-night confessed that there are a few mistakes in the 1,200 plates already published; and I believe that there are a few more that he has not yet discovered. How could it be otherwise? But this does not in any way detract from the credit due to the author for boldness, accuracy, and industry. Did ever anybody see a first, or even a second or a third edition of a book on Phanerogamous Botany without a very large number of mistakes and misprints? How much more easily will errors creep in, with how much greater difficulty will they be discovered, in a work on Cryptograms? The proofs of Dr. Cooke's illustrations could not be corrected by looking into a dictionary for the spelling of a word, or into a herbarium for a specimen of a plant; a delicate tint not rendered quite correctly here, the omission of a letter there, a name wholly misplaced, and the fact overlooked. How could all these be avoided? Besides all this liability to error due to the mere production of the work, there are errors that have crept into our nomenclature, and that are still, probably in some cases, being handed down by tradition, owing to the method in which names are sometimes assigned to specimens. Fungi are for the most part putrescent in a very rapid manner; they are seldom in a condition to be profitably studied some weeks after they have been gathered, at one's leisure, with description and plates at one's side. There were no figures in existence of a great many before Dr. Cooke's, but they had often to be named by some master in the hunting field itself, and often amidst such a list of freshly-gathered specimens that it

is not to be wondered at if names were sometimes wrongly given; there was no time to discuss the specimen, and an erroneous tradition might possibly be handed down. The king of mycologists, Elias Fries himself, once misled the whole Woolhope Club by writing down through a mere lapsus calami, the word *saginus* for *triumphans*. As soon as I had mastered the ABC of the subject, I could not satisfy myself by resting so fully on tradition, and I am afraid at one time I earned a bad reputation as an incorrigible sceptic. The rectification of some names, such as that of *Agaricus storea*, to which Dr. Cooke has alluded this evening, was in some measure due to this sceptical spirit; so perhaps I the more readily render the expression of my unbounded admiration at Dr. Cooke's stupendous work and well-merited success, and foretell the higher honour still which all noble minds will offer to him because of his generous boldness in confessing thus publicly to the few errors to be found in his work.

NEW BRITISH FUNGI.

By M. C. COOKE.

(Continued from p. 8.)

Agaricus (Armillaria) citri, *Inzengi Sic. t. 3, f. 1. Fries Hym. Eur. 46. Cooke Illus. t. 1181.*

Cæspitose, pileus fleshy, thin (about 1 inch), rather umbonate, smooth, sulphur-yellow, margin crenulate, becoming whitish, stem slender (2-3 in. \times 1-2 lines), apex whitish floccose, pallid, downwards rufescent, ring spreading, thin, broad; gills adnate, crowded, white. Odour of fresh meal. Spores minute, $5 \times 4 \mu$.

On trunks. Kew.

Agaricus (Clitocybe) occultus, *Cooke Illus. Supp. t. 1184.*

Pileus fleshy, convex, then plane, and depressed, even, smooth, but innately virgate (5-7 c.m. diam.), viscid, pallid, smoky about the disc, whitish at the margin, stem equal, or slightly expanded above into the pileus, solid, white, striately fibrillose (4-6 c.m. long, 1 c.m. thick), often curved; gills rather distant and broad (to 5 m.m.), adnate, a little decurrent, scarcely emarginate, white; substance white, tough, cartilaginous.

Gregarious on charred ground. Chingford, Nov., 1883.

Near *Ag. coffeatus*.

Agaricus (Collybia) eustygius, *Cooke Illus. Supp. t. 1185.*

Pileus rather fleshy, convex, then plane, sometimes depressed (3-5 c.m. broad), even, smooth, becoming shining when dry, tough, dingy-white, a little darker about the disc, margin thin, smooth, occasionally flexuous, stem stuffed, rarely hollow, attenuated downwards into a rooting base (5-8 c.m. long, 6-8 m.m. thick), white above, sprinkled with small punctate scales, darker below, and

often becoming fuliginous, somewhat longitudinally striate or fibrous; gills rather broad, rounded behind, not crowded, dark grey. Spores white, globose, 4-5 μ . Odour of rancid meal. Whole plant in drying becoming black.

On the ground. Whitfield.

Allied closely to *Ag. rancidus*.

Agaricus (Mycena) consimilis, *Cooke Illus. Supp. t. 1186*.

Gregarious. Pileus membranaceous, conically campanulate, soon with the margin reflexed (2½-3 c.m. broad), striate to the middle, at length splitting, smooth, opaque, cinereous with the umbo darker. Stem attenuated upwards, often compressed below, rather rigid, dry, smooth, paler than the pileus (4 c.m. long, 2 m.m. thick above, nearly twice as thick below), fistulose; gills slightly adnate, nearly free, linear, scarcely crowded (2 m.m. broad), cinereous. Odour none.

Amongst grass. Kew Gardens.

Similar to *Ag. leptcephalus*.

Lactarius involutus, *Soppitt. Cooke Illus. t. 1194*.

Every part white, with pale ochraceous tinge. Pileus 1-2 in. across, firm, equally fleshy up to the margin, smooth, even, convex, becoming plane or slightly depressed, margin arched, strongly involute, extreme edge minutely silky; gills subdecurrent, densely crowded, very narrow, sometimes forked; spores white, pip-shaped, smooth, 5 × 3 μ ; stem solid, equal or slightly incrassated below, glabrous, even, about 1 in. long by 3 lines thick; milk not scanty, white, very hot, unchangeable.

On the ground. Bolton Woods, Yorks.

Resembling *Lactarius vellereus* in miniature, but with the pileus perfectly glabrous. Almost too near to *Lactarius scoticus*.

Russula (Furcatæ) virginea, *C. & M. Cooke Illus. Supp. t. 1197*.

Mild. Pileus fleshy, firm, convex, then depressed (5 c.m. diam.), smooth, even, viscid when moist, polished when dry, margin even, snow white. Stem attenuated upwards, firm, solid (5 c.m. long, 2 c.m. thick at the base), finely rugulose; gills very narrow, crowded, subdecurrent, repeatedly forked, connected by veins, brittle, as well as the stem, quite white. Spores globose, 4 μ .

On the ground, under trees. Burnham Beeches.

Differing from *R. lactea* in the depressed pileus, rugose stem, and rather crowded, very narrow gills, as well as in the very minute spores.

Peridermium coruscans, *Fr. S. V. S. 510, Sacc. Syll. 2981*.

Pseudoperidia numerous, always longitudinally disposed, at first closed, ellipsoid, then membranaceous, whitish, tubulose, spreading at the apex, pale red; æcidiospores for the most part globose, subglobose, or subellipsoid, regular, golden yellow, 30-35 × 20-24 μ . Epispore thin, warted.

On foliage of *Abies pinsapo*. Haslemere.

Gloeosporium affine, *Sacc. Syll.* 3707.

Spots variable in size and form, becoming bleached; pustules scattered, mostly on the upper surface, at first covered with the blackened cuticle, then erumpent in tendrils, conidia cylindrically oblong, rounded at the ends, $14-20 \times 4-6 \mu$, hyaline, on short filiform basidia.

On leaves of *Hoya* and *Æschynanthus*, in hothouses. Glasgow. (*D. A. Boyd.*)

Dactylaria orchidis, *Cke. & Mass.*

Scattered. Hyphæ single, erect, arising from a thin branched mycelium. Threads septate (250-280 μ high, 10-12 μ thick), rufous orange, divided at the apex into two or three short branches which are again shortly furcate. Conidia fusoid, quadrinucleate, then triseptate, hyaline ($40-50 \times 7-9 \mu$), solitary at the apex of all the branchlets, and forming a lax capitulum.

On decaying leaf of *Oncidium macranthum*. Kew.

BRITISH PYRENOMYCETES.

By G. MASSEE.

(Continued from page 14.)

S. macularis, *Fr., Sacc. Syll.* 1873.

On poplar leaves. Apethorpe.

S. œdema, *Fr., Sacc. Syll.* 1885.

On elm leaves. Darenth; Wandsworth.

S. cinerascens, *Fckl., Sacc. Syll.* 1895; *Hdbk.* 2758.

On hawthorn, ash, *Sorbus*, *Pyrus*, and *Salix* leaves. Shere; Henlow, Beds.

S. vaccinii, *Cke., Sacc. Syll.* 1901; *Hdbk.* 2759.

On leaves of *Vaccinium myrtillus*. Shere; Hurtwood, Surrey.

S. brachytheca, *Cke., Sacc. Syll.* 1903.

On leaves of *Vaccinium vitis-idaea*. Forres.

** On herbaceous plants.

S. brassicicola, *Duby., Sacc. Syll.* 1939; *Hdbk.* 2768.

On various cruciferous plants. Shrewsbury, Lincoln, Forden, Batheaston.

S. microspila, *B. & Br., Sacc. Syll.* 1942; *Hdbk.* 2767.

On leaves of *Epilobium montanum*. Perth; Shere; Forden.

S. innumeralla, *Karst., Sacc. Syll.* 1957.

On *Comarum palustre*. Shrewsbury.

S. hieracii, *Cke. & Mass.*

On *Hieracium pilosella*. Tunbridge Wells.

- S. isariphora*, *Desm.*, *Sacc. Syll.* 1792 ; *Hdbk.* 2763.
On leaves of various species of *Stellaria*. Common.
- S. eryngii*, *Wallr.*, *Sacc. Syll.* 1976 ; *Hdbk.* 2761.
On dead leaves of *Eryngium*. Hasbro', Norfolk.
- S. rumicis*, *Desm.*, *Sacc. Syll.* 1980 ; *Hdbk.* 2769.
On living leaves of various species of *Rumex*. Common.
- S. plantaginis*, *Sollm.*, *Sacc. Syll.* 1987.
On *Plantago media*. King's Lynn.
- S. pinodes*, *B. & Blox.*, *Sacc. Syll.* 1989 ; *Hdbk.* 2732.
On pea stems. Twycross.
- S. peregrina*, *Cke.*, *Sacc. Syll.* 2011.
On *Rubia peregrina*. Symonds Yat, Hereford.

B. ON MONOCOTYLEDONS.

- S. allicina*, *Fr.*, *Sacc. Syll.* 2023 ; *Hdbk.* 2770.
On *Allium*. Shere.
- S. brunneola*, *Fr.*, *Sacc. Syll.* 2026 ; *Hdbk.* 2777.
On Tiger lily and *Convallaria*. Shere, Highgate, King's Cliffe.
- S. iridis*, *Awd.*, *Sacc. Syll.* 2031.
On Iris leaves. Shrewsbury.
- S. chlouna*, *Cke.*, *Sacc. Syll.* 2037.
On *Phalaris arundinacea*. Shere.
- S. anarithma*, *B. & Br.*, *Sacc. Syll.* 2039 ; *Hdbk.* 2771.
On *Aira cæspitosa*. Somerset.
- S. epistroma*, *Cke.*, *Sacc. Syll.* 6067.
On straw. Norfolk.
- S. scirpi-lacustris*, *Awd.*, *Sacc. Syll.* 2053.
On *Scirpus*. Lynn, N. Wootton.
- S. caricicola*, *Fckl.*, *Sacc. Syll.* 1642.
On *Carex*. N. Wootton.
- S. typhæ*, *Lasch*, *Sacc. Syll.* 2060.
On *Typha latifolia*. Terrington.

C. ON ACOTYLEDONS.

- S. pteridis*, *Desm.*, *Sacc. Syll.* 2061 ; *Hdbk.* 2765.
On *Pteris aquilina*. King's Cliffe ; Eccles, Norfolk ; Forden.
- S. aquilina*, *Fr.*, *Sacc. Syll.* 2063.
On *Pteris aquilina*. Darent.
- S. filicum*, *Desm.*, *Sacc. Syll.* 2065.
On *Lastræa filix-mas*. Shrewsbury.

D. SPECIES IMPERFECTLY KNOWN.

- S. corylaria*, *Wallr.*, *Sacc. Syll.* 2072.
On hazel leaves. Shere.
- S. arbuti*, *Fr.*, *Sacc. Syll.* 2081.
On *Arbutus*. Glencoe, N.B.

S. atomus, *Desm.*, *Sacc. Syll.* 2085.

On beech leaves. Shere; Darent; Wrekin, Shropshire.

S. aucupariae, *Lasch.*, *Sacc. Syll.* 2086.

On *Sorbus aucuparia*. Manchester; Trefriew, N. Wales.

SUB-GEN. **Epicymatia**, *Fekl.* Growing on Lichens, 1-3 septate.

S. vulgaris, *Fekl.*, *Sacc. Syll.* 2231.

On *Lecanora subfusca*. Lynn.

S. thallina, *Cke.*, *Sacc. Syll.* 2234.

On *Physcia obscura*. Eastbourne.

S. thallophila, *Cke.*, *Sacc. Syll.* 2238.

On lichen thallus. Eastbourne; Glen Shee.

GEN. 3. **SPHÆRULINA**. Sporidia 3 or many septate.

S. myriadea, *D.C.*, *Sacc. Syll.* 3254; *Hdbk.* 2752.

On oak leaves. Shere, Albury, Neatishead.

S. Leightoni, *Berk.*, *Sacc. Syll.* 3532; *Hdbk.* 2764.

On leaves of *Linnaea borealis*. Glen Dole, Clova.

S. helicicola, *Desm.*, *Sacc. Syll.* 3454.

On ivy leaves. Carlisle.

S. hederæ, *Sow.*, *Sacc. Syll.* 3455; *Hdbk.* 2744.

On ivy leaves. Shere.

S. empetri, *Fr.*, *Sacc. Syll.* 3463.

On *Empetrum nigrum*. Shropshire; Scotland.

AUSTRALIAN FUNGI.

(Continued from p. 5.)

Polyporus (Lign) subzonalis, *Cooke*

Suberous, rather thin, rigid, sessile. Pileus reniform, or laterally connate (2-3 in. diam.), pubescent, at length smooth, radiately rugose, faintly concentrically zoned, with numerous linear zones, wholly cream-coloured, substance similar, margin acute, strongly incurved, hymenium nearly of the same colour, pores punctiform, rounded, $\frac{1}{8}$ μ diam.

On wood. (Daintree River) Queensland.

Differs from *P. zonalis* in the paler, more pubescent pileus, whitish hymenium, shorter tubes, and larger pores.

Fomes (Fomentarii) concavus, *Cooke*.

Pileus very hard, convexo-flattened, semi-orbicular, deeply decurrent and effused behind, becoming nearly black, concentrically sulcate, and somewhat rugose or tuberculate (4-6 in. diam.),

comparatively thin ($\frac{1}{2}$ - $\frac{3}{4}$ inch), covered with a hard crust. Substance very thin and floccose, together with the elongated, stratosed tubes, wood-coloured, pores very minute, round, regular punctiform, scarcely visible. Hymenium concave, pale ochraceous; margin thin, incurved, flexuous, sterile.

On trunks. Johnstone River, Queensland.

Allied to *F. sulcatus*, Cooke.

* ***Hydnum (Carnosi) crocidens*, Cooke.**

Mesopod. Pileus fleshy, thin, plane, rather umbilicate, smooth, even (1-1 $\frac{1}{2}$ in. diam.), ochraceous yellow; stem central, slender, equal, even, or longitudinally striate, when dry, smooth, of the same colour as the pileus (1 $\frac{1}{2}$ in. long, 2-3 m.m. thick). Spines rather long, acuminate, reaching the stem, but scarcely decurrent, shorter towards the margin, flexible, golden yellow; spores subglobose, 4-5 μ .

On the ground. Port Phillip.

***Scleroderma umbrina*, Cke. & Mass.**

Stipitate, peridium globose (2 $\frac{1}{2}$ -3 c.m. diam.), coarsely rugulose below (when dry), very thin, fragile, and perfectly glabrous above, breaking away irregularly, dirty pale ochre, darkest below; stem equal (2 $\frac{1}{2}$ c.m. long, $\frac{1}{2}$ c.m. or more thick), coarsely and irregularly furrowed (when dry), dark brown, passing downwards into a dense bulbous mass of intricate mycelium; mass of gleba dark umber-brown; spores globose echinulate, brown, 10 μ diam.; dissepiments almost obsolete at maturity.

On the ground. Queensland.

***Dothidea (Bagnisiella) rugulosa*, Cooke.**

Epiphyllous, or hypophyllous, gregarious, globose, black, rugulose ($\frac{1}{2}$ - $\frac{3}{4}$ m.m.), cells peripheral, minute; asci oblong, eight spored; sporidia cylindrically elliptical, hyaline, 22-25 \times 4 μ .

On leaves of *Eucalyptus*. Melbourne. (Martin 203.)

* ***Isaria suffruticosa*, Cke. & Mass.**

Subcaespitose, white, 3 c.m. high; stem distinct, simple, smooth or slightly farinose, upwards branched and divided; branches slender, interwoven, with lateral branchlets up to the acute tips; ultimate threads bearing the conidia singly at the apex of short sterigmata, minute, narrowly ellipsoid, 4-5 \times 1 $\frac{1}{2}$ μ .

On hairy caterpillar. New England, Australia. (A. R. Crawford.)

***Strumella sacchari*, Cooke.**

Pustules gregarious, erumpent, black, patelloid or subclavate, with a short stem-like base, or cylindrical-multiform ($\frac{1}{2}$ m.m. diam.) hyphae short, hyaline, simple; conidia cylindrically elliptical, continuous, pale fuscous, 10-12 \times 3 μ .

On sugar cane. Queensland. (Bailey 871.)

***Agaricus (Mycena) flavovirens*, Cke. & Mass.**

Pileus membranaceous, obtusely campanulate ($\frac{1}{2}$ to 1 c.m. broad and high), yellowish green, faintly striate when moist, smooth,

stem slender, erect, smooth, even, fistulose, paler than the pileus (2-2½ c.m. long, scarcely 1 m.m. thick). Gills broadly adnate, not crowded, plane lemon yellow. Spores minute, 5-6 × 3 μ, white.

On tree ferns. Victoria. (*Mrs. Martin*, 524.)

Agaricus (*Flammula*) *rubra*, Cke. & Mass.

Pileus fleshy, convex, at length depressed, apparently dry, smooth, even, shining (2½ c.m. broad), red, with a tinge of purple; stem equal, hollow smooth, paler than the pileus (4 c.m. long, 4 m.m. thick). Gills rather broad, not crowded, adnate, with a decurrent tooth, at first coloured like the pileus, then dusted with the ferruginous spores, which are elliptic, 7 × 4 μ. Flesh, and substance of the gills, permanently roseate.

On the ground. Oakleigh, Victoria. (*Mrs. Martin*, 526.)

CHAINODERMA, Mass. (n. g.)

Peridium elongato-fusiform or clavate, tapering into a short stem-like base, wall rather thick, consisting of a single stratum; columella thick, compact, passing quite through the peridium, and firmly attached to the apex; the cavity between the columella and the outer wall is occupied by the gleba, consisting of numerous interwoven septate hyphae, bearing clusters of tetrasporous clavate basidia at intervals; spores unicellular, coloured. Dehiscence is effected by the splitting of the central portion of the wall into longitudinal shreds, due to the shortening of the columella.

Allied to *Podaxis* in the structure of the gleba, distinguished by the unmistakable tetrasporous basidia bearing the spores on distinct sterigmata, also in the peculiar mode of dehiscence; in the present genus the gleba is not lacunose as in *Secotium*.

Chainoderma *Drummondii*, Mass.

Clavato-fusiform (5-6 c.m. high, by 1.5 c.m. at widest part), peridium dingy brown, smooth, even, columella pale; mass of spores dingy brown; basidia 50 × 12 μ, clavate, fasciculate; spores broadly elliptical, with the remains of the sterigma usually persistent, epispore thick, smooth, 10 × 8 μ. *Secotium Drummondii*, *Berk. in Herb.*

On the ground. Swan River. (*Drummond*.)

The peridium never becomes free from the stem at the base, as in *Podaxis*, but on the shortening of the columella, due to contraction, is bulged outwards and split into longitudinal shreds, leaving gaping chinks through which the spores escape.

Puccinia *rumicis-scutati* (D.C.), Winter Pilze 187, Sacc. Syll. VI., 2214.

Sori scattered, or disposed in a circle, irregularly rounded, or (on stems and petioles) elongated, girt by the torn epidermis, brown. Uredospores ellipsoid or ovoid, rarely globose or oblong (26-40 × 20-28 μ), aculeate, yellow-brown; teleutospores oblong, or clavate, a little constricted in the middle or not at all, incrassated at the apex, rounded or somewhat attenuated, narrowed at

the base into the pedicel ($38-56 \times 16-28 \mu$), slightly brown; pedicel long, persistent brown.

var. **Muhlenbeckia**.

On the upper surface, scattered, sori at first bullate. Telentospores constricted, each cell somewhat triangular ($36 \times 12 \mu$).

On leaves of *Muhlenbeckia adpressa*. Victoria. (Mrs. Martin, 437.)

Zignoella australica, Cke. & Mass.

Peritheciis sparsis, semi-immersis, subconicis, basi ligno insculptis, pertusis, atris ($\frac{1}{2}$ m.m. diam.). Ascis cylindraceis, substipitatis, octosporis, sporidiis arcuatis fusiformibus, 5-7 septatis, hyalinis ($40 \times 4 \mu$), ad septa non constrictis.

On naked wood. Victoria. (Mrs. Martin.)

Phyllosticta soriformis, Cke. & Mass.

Spots brown, orbicular, with a darker margin (2 m.m. diam), on both surfaces. Perithecia minute, aggregated in the centre of the spots, rather prominent, piercing the cuticle (resembling superficially some Uredine). Sporules elliptic ($4.5 \times 2 \mu$), pale amber colour, hyaline.

On leaves of some *Proteaceae*. Victoria. (Mrs. Martin, 518.)

Septoria phyllodiorum, Cke. & Mass.

Perithecia densely gregarious, on both surfaces, without definite spots, often occupying the whole surface, immersed, covered by the cuticle, globose-depressed, black, pierced at the apex. Sporules cylindrical, obtuse at the ends, multinucleate, then 3-5 septate, hyaline, $40 \times 3 \mu$.

On phyllodes of *Acacia longifolia*. Victoria. (Mrs. Martin, 532.)

Marsonia acaciæ, Cke. & Mass.

Spots irregular, or confluent, pallid or whitish, with a brown margin ($\frac{1}{2}$ -1 c.m. long). Pustules gregarious on the spots, at length splitting the cuticle irregularly, and ejecting the conidia in tendrils. Conidia cylindrical, rounded at the end, arcuate or sigmoid, or flexuous, uniseptate, $40 \times 8 \mu$, hyaline, pale brownish, with granular contents.

On phyllodes of *Acacia*. Victoria. (Mrs. Martin, 506.)

FUNGI OF NEW ZEALAND.

By M. C. COOKE.

Secotium virescens, Mass.

Peridium ovate, apex acute, basal portion at first attached to the stem, becoming free and expanding, wall coriaceous, even, smooth and shining, pale green; stem below basal attachment of peridium short, incrassated, tapering upwards, solid, smooth and even, yellowish at the base; gleba bright ferruginous orange, cavities small, sub-equal and regular, septa thin; basidia large,

clavate tetrasporous, sterigmata slender, elongated; spores elliptic-oblong, smooth, bright rusty-orange, $18-20 \times 7-8 \mu$.

On the ground. New Zealand. (*Colenso*, 722 b); (*Kirk*, 337.)

Peridium 3×2 c.m., stem below basal margin of peridium, .5 c.m. long.

Resembling *S. acuminatum* in shape, but smaller, and differing in colour, polished peridium, and more especially in the spores. A portion of the type specimen of *A. acuminatus* sent by Montagne to Berkeley has pale olive, broadly elliptical spores measuring $5-6 \times 4 \mu$.

Uredo inflata, *Cooke*.

Amphigena. Soris irregularibus, bullatis, din tectis (2 mm. long), pallidis. Uredosporis subglobosis, laevibus ($18 \times 14 \mu$). hyalinis, vix tinctis (siccis) episporio crassiss, pedicello brevi.

On living leaves of *Ligusticum latifolium*. Campbell Island, New Zealand. (*Kirk*, 346.)

Uredo Oleariæ, *Cke*.

Hypophylla. Maculis nullis. Soris subrotundatis, subgregariis, mox apertis, pulverulentibus, aureo-fuscis (1 m.m. diam.). Uredosporis globoso-ovatis, laevibus, pallido flavidis ($22 \times 15 \mu$), breviter pedicellatis.

On living leaves of *Olearia Lyallii*. Port Ross, New Zealand. (*Kirk*, 374.)

Diatrype elliptica, *Cooke & Mass.*

Stromatibus ellipticis ($7 \times 2\frac{1}{2}-3$ m.m.), atris, opacis, rugulosis. Ostiolis inconspicuis, matrici basi insculptis, lineo nigro in matrici profunde circumscriptis, contextu pallidis; peritheciis magnis, paucis, ascis cylindraceis, stipitatis, octosporis. Sporidiis linearibus, rectis vel curvulis, utrinque rotundatis, uniseriatis, $12 \times 5 \mu$ hyalinis.

On decorticated branches. Hawkes' Bay, New Zealand. (*T. Kirk*, 367.)

Rhytisma (Cocconia) discoidea, *Cke. & Mass.*

Orbicularis, convexa ($1-1\frac{1}{2}$ m.m. diam.) atra, glabra, subnitida, intus olivacea. Ascis clavatis, subsessilibus, octosporis, sporidiis oblongis, uniseptatis, medio leniter constrictis, dilute olivaceis, $22 \times 5 \mu$.

On leaves of *Veronica elliptica*. New Zealand. (*Kirk*, 338.)

Erinella hyalopoda, *Cke. & Mass.*

Stipitata, gregaria vel sparsa, alba. Cupula cyathiformia, ($1-1\frac{1}{2}$ m.m. high, $\frac{1}{2}$ m.m. broad), tenui, pilis deciduis brevibus, flaccidis ornata, stipite gracili, elongato, hyalino, ad basim incrassato, sæpe sursum furcato. Ascis cylindraceo-clavatis ($150 \times 10 \mu$). Sporidiis inordinatis, bacillaribus, multinucleatis ($35 \times 2-3 \mu$) paraphysibus sursum acutis.

On dead *Phormium*. New Zealand. (*T. Kirk*, 340.)

Isaria aggregata, *Cke. & Mass.*

Cæspitosa, stromatibus basi incrassatis, confluentibus, sursum subacutis, simplicibus, rarissime furcatis, subinde compressis

flexuosive (1 c.m. longis) in corticem fasciculato-erumpentibus, fasciculis gregariis, cinereis, glaucescentibus, conidiis albidis, $3 \times 2 \mu$.

On Mahoe bark. Mount Egmont, New Zealand. (*Kirk*, 351.)

Stemphylium insidens, *Cke. & Mass.*

Effusum, atro-fuscum. Hyphis tenuibus, effusis, ramosis, conidiis ad apicem ramulorum solitariis, ellipticis, triseptatis, ad septa constrictis, uno alterove cellulo longitudinaliter divisus, atrofusis $18-20 \times 8 \mu$.

On leaves of *Pleurophyllum speciosum*. Campbell Island. (*Kirk*, 341.)

SCLERODEPSIS.

By M. C. COOKE.

There are a few species hitherto included under the genus *Trametes* which are only there by sufferance, and do not accord with the character of that genus as now understood. For these we have proposed a new location under the generic name which one of its finest species has borne as its specific designation, as follows:—

SCLERODEPSIS, *Gen. nov.*

Pileus flattened, usually scutate at the base, hard, woody, thin; margin acute; substance of pileus thin, continuous with the hymenium; pores large, rounded or angular, sometimes confluent and elongated, not stratose, edge acute, sometimes dentate.

= *Trametes*, in part.

To this genus belongs —

Sclerodepsis colliculosa (*Berk.*).

= *Trametes colliculosa*, *Sacc. Syll.* 6237.

Sclerodepsis Berkeleyi, *Cooke.*

= *Trametes sclerodepsis*, *Berk.*, *Sacc. Syll.* 6209.

Sclerodepsis lobata (*Berk.*).

= *Trametes lobata*, *Berk.*, *Sacc. Syll.* 6208.

Sclerodepsis Beyrichii (*Fries.*).

= *Trametes Beyrichii*, *Fries.*, *Sacc. Syll.* 6201.

The principal features in which the species composing this genus recede from *Trametes* consist in the acute edge of the pileus, the acute dissepiments of the pores (not thick and rounded), which are sometimes dentate, characters incompatible with *Trametes*, in which we conceive an important characteristic to be "pores obtuse, entire."

SYNOPSIS PYRENOMYCETUM.

(Continued from Vol. xviii., p. 80.)

Fam. 17. MICROTHYRIACEÆ, Sacc. Perithecia sub-superficialia, membranacea vel carbonacea, dimidiata, applanata, contextu radiato, centro pertuso vel astoma.

GEN. 1. **MICROTHYRIUM.** Perithecia membranacea.

* MYIOCOPRON, Speg. *Sporidia continua.*

5856. corrientinum, Speg. 5352	5864. orbiculare, Cooke... 5360
5857. dilatatum, B. & Br. 5353	5865. cubense, B. & C.... 5361
5858. coffeinum, Ces. ... 5354	5866. orchidearum, Mont. 5362
5859. granulatum, B. & Br. 5355	5867. licatense, P. & B. 5363
5860. oleandri, Pass. ... 5356	5868. baccarum, Rehm. 5364
5861. ilicinum, De Not... 5357	5869. palmarum, Wint. 7323
5862. vaccinii, De Not... 5358	5870. crustaceum, Speg. 7324
5863. smilacis, De Not... 5359	

** PIPTOSTOMA. *Sporidia oblonga, curvula.*

5871. spilotum, B. & Br. 7325

* PARNULARIA. *Ascis globosis (?)*.

5872. styracis, Lev. ... 5365

*** MICROTHYRIUM. *Sporidia uniseptata.*

5873. microscopicum, Desm. ... 5367	5886. circinans, Speg. ... 5376
5874. paraguayense, Speg 7327	5887. punctiforme, B. & C. 5377
5875. quercus, Fckl. ... 5386	5888. pulchellum, Speg. 7331
5876. thyriascum, Schulz 7328	5889. gomphisporum, B. & Br. ... 5378
5877. rubi, Niessl. ... 5369	5890. Boivini, Mont. ... 5379
5878. arcticum, Oud. ... 7329	5891. fuscillum, Sacc. ... 5380
5879. minutissimum, Thum. ... 5370	5892. caaguazuense, Speg. 7332
5880. idæum, S. & R. ... 7330	5893. alpestre, Sacc. ... 5381
5881. cytisi, Fckl. ... 5371	5894. lunariæ, Kunze. ... 5382
5882. juniperi, Desm. ... 5372	5895. albigenum, B. & C. 5383
5883. pinastri, Fckl. ... 5373	5896. citri, Penz. ... 5384
5884. mauritanicum, D.R. & Mont. ... 5374	5897. paradoxum, B. & C.
5885. litigiosum, Sacc.... 5375	5898. epimyces, Sacc. (Bom. & Rouss.)

*** SEYNESIA. *Sporidia uniseptata, fusca.*

5899. nobilis, W. & C. ... 5388 5903. guaranítica, *Speg.* 7336
 5900. grandis, *Wint.* ... 7333 5904. piraguensis, *Speg.* 7337
 5901. Balansæ, *Speg.* ... 7334 5905. melanosticta, C. & M.
 5902. paraguayensis, *Speg.* 7335

*** SACCARDINULA, *Speg.* *Sporidia muralia, hyalina.*

5906. guaranítica, *Speg.* 7342

GEN. 2. **CLYPEOLUM**, *Speg.* Perithecia carbonacea.* *Sporidia didyma, hyalina.*

5907. atro-areolatum, 5909. minutissimum, *Speg.* 5387
 Speg. ... 5385 5910. zeylanicum, C. & M.
 5908. brasiliense, *Speg.* ... 5386 5911. amazonicum, C. & M.

** VIZELLA. *Sporidia continua, fusca.*

5912. conferta, *Cooke* ... 5366 5913. hieronymi, *Wint.* 7326

** SCUTELLUM. *Sporidia 2-septata, fuliginea.*

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 5917. æruginosa, *Wint.* 7339 5922. maculata, C. & M.
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FUNGUS FORAYS, 1890.

There is but little to report which is at all satisfactory to the mycologist in the Fungus Forays of the present year. All the results of any moment will be represented on the page devoted to "British Fungi." The weather was as fine as could well be

desired, but the weary walking was in vain, for all kinds of fungi were conspicuously absent, even more so than in the previous two years.

CRYPTOGAMIC SOCIETY OF SCOTLAND.—The sixteenth annual Conference was held at Boat of Garten (Station on Highland Railway), on Tuesday, 23rd September, and following days.

WOOLHOPE FIELD CLUB.—The annual Forays commenced on Tuesday, Sept. 30, with an excursion to Whitfield, and was the most successful day of the week, although, at the time, it was considered worthy of only a poor estimate. On Wednesday the trip was to Belmont and Haywood Forest, which resulted in nothing of particular interest. Thursday, Oct. 2nd, was devoted to the lawns and grounds of Rotherwas Court, and after the dinner, as well as on the previous evening, several papers were read; on "Controverted Agarics," by M. C. Cooke; on "The unexpected appearance of two species of Fungus in a field which was under regular cultivation four years ago," by the Rev. Canon du Port; "Remarks on Teratology," by the Rev. J. E. Vize; "The Florula of the Doward Hills—Mosses," by the Rev. Augustin Ley; on "Oyster Culture," by Dr. A. J. Crispi; and on "Trap-door Spiders," by the Rev. J. E. Vize. Friday, the last day, was taken up by an excursion to Devereux Park, by permission of Lady Emily Foley, and a little diversion to Stoke Edith. It was a general impression that even fine weather may be purchased at too high a price.

ESSEX FIELD CLUB.—The annual Foray was taken this year in a district remote from Epping Forest, in which the previous Forays have taken place, on Friday and Saturday, Oct. 10th and 11th. Bishop's Stortford having been selected as head-quarters, excursions were made to Hatfield Forest, near Great Hallingbury, and during the two days every effort was made to add to the list of Essex Fungi, by dint of which exertion, not less than twenty species, small and large, were recorded for the first time. Considering the unfavourable season, this was regarded as a somewhat successful issue. The locality was an excellent one, and, in a damp season, would doubtless have been prolific.

HERTFORDSHIRE FIELD CLUB.—On Wednesday, Oct. 8th, the annual excursion was taken to Hatfield Park, but as far as we can ascertain nothing was found that was considered specially noteworthy.

HAMPSHIRE FIELD CLUB.—Excursion postponed on account of the dryness of the season.

BURNHAM BEECHES.—A private excursion to this interesting locality on Oct. 17th was comparatively successful, as 130 species were met with and recorded, and one or two of these possessed considerable interest. It was damper than most of the places visited this year.

M. C. COOKE.

MEMORABILIA.

CINTRACTIA AXICOLA (*Berk.*).—There has been some error in regard to this species. The original type specimen from St. Domingo is not a *Cintractia*, but an *Ustilago*, as are also Australian specimens. The variety B, from Alabama, is the *Cintractia*, from which a fragment must have been sent to M. Cornu, without examination, under the impression that all the specimens under the same name in the Berkeley Herbarium were the same species. Hence there are two species, *Ustilago axicola* (B.) from St. Domingo and Australia, and *Cintractia axicola* (B.) from North America. The former is probably the same as *Ustilago fimbriatylis*, Thumen.

BRAITHWAITE'S BRITISH MOSS FLORA.—The thirteenth part contains Splachnaceæ, CEdipodiaceæ, Funariaceæ, and the first part of Bryaceæ, with six plates. The 14th part is announced to contain the continuation of Bryaceæ.

RUSSULA BARLÆ AND NITIDA.—By some error of the printer, at page 335 and 336 of the reprint of "Handbook," the varieties *cuprea* and *pulchralis* are placed under *Russula Barlæ* instead of *Russula nitida*. This error occurred in making up the pages, and has only now been detected. Both are varieties of *Russula nitida*, so that the description No. 1236 should precede them.

GEOGLOSSUM GLABRUM, *Pers.*—We regret to have to protest against the substitution, in Saccardo's Sylloge (viii., p. 43) of *Geoglossum ophioglossoides* for this old and long-established name, the more especially when the similar *Cordyceps ophioglossoides* is liable to be confounded with it.

SPECIES OF FUNGI.—The number of species of Fungi enumerated in Saccardo's Sylloge is 31,927 (Vol. viii., p. 16). The number included in Streinz Nomenclatorum (1862) was 11,893. Not less than 12 or 15 years ago ("Tendencies of Systematic Botany") we estimated roughly that the number was not less than 20,000. At the time it was urged against us that this estimate was too high, and the paragraph was called in question in which we stated that "we think it is a very safe estimate to place the number of species of fungi at 20,000." It appears now that, for a rough estimate, we were at that time tolerably near the truth.

POLYPORUS PISIFORMIS, *Kalch.*—The specimen of this fungus, sent to the Editor many years since, when the species was described, is now in the Kew Herbarium, and is a genuine *Polyporus*, although not fully developed. It may be that it is a juvenile form of some well-known species, but, at any rate, it is not the same thing as Herr Bresadola has had under notice as a *Gasteromyce*.

ILLUSTRATIONS OF BRITISH FUNGI.—The publication of the final parts has been delayed in order to include any new or rare

species found in the present autumn. In this manner it has been found possible to issue parts 75 and 76 as *final*, with title pages and index, early in the coming year, and also to bring the letter-press to a close, for which a complete index is in preparation.

ATTRACTIVE ODOURS IN FUNGI.—Apropos of a discussion proceeding elsewhere, on the attractiveness, or otherwise, of odours in fungi, the well-known *Russula foetens* might be supposed to furnish an illustration. It certainly seems to be attractive to slugs, since it is usually found more or less eaten by them, but has the *odour* any attraction? Some specimens, we confess, and probably the majority, have a strong foetid odour, but, every season, wet or dry, specimens will be met with possessing no appreciable odour at all, whilst occasionally a few will be discovered which possess a distinctly pleasant fragrant odour. This raises the question whether the odour is of any value, whether attractive or protective, since it is evidently not persistently a feature in *Russula foetens*. We have not noticed whether the inodorous or the fragrant individuals have been bitten by slugs, but our impression is that none of the fragrant examples we have seen have exhibited any trace of slugs. This would be an interesting fact if verified, since *Agaricus odoratus* and *Agaricus fragrans*, with a like odour, are not attacked by molluscs.

ANIMAL MYCOPHAGISTS.—The late Mr. James English, of Epping, who was a shrewd observer, and a constant visitor in Epping Forest, at all seasons of the year, has often called attention to the fact that squirrels, which are plentiful in the forest, were very fond of eating the tops of the large species of *Boletus*. We have, in his company, witnessed them in the enjoyment of their feast. The bright yellow, pine-loving species are very rare there, and hence were exempt, as well as the poisonous species of the *luridus* group, but we fancy it to have been *B. pachypus* and *B. impolitus* which were the greatest sufferers. Has any of our readers any knowledge of squirrels eating other fungi than *Boleti*, and if so, which? Are any other rodents addicted to fungus-eating, such as field mice, stoats, weasels, etc.? as we are not aware of any record of such proclivities.

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A QUARTERLY RECORD OF CRYPTOGAMIC BOTANY
AND ITS LITERATURE.

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 f. rupestris, *D. C.*
 9 *P. areolata* (*Clem.*), *Nyl.*
 10 *P. ceuthocarpa* (*Sm.*), *Hook.*
 f. variolosa, *Mudd.*
 11 *P. coccodes* (*Ach.*), *Nyl.*
 f. bacillosa, *Nyl.*
 12 *P. velata* (*Turn.*), *Mudd.*
 f. aspergilla (*T. & B.*), *Cromb.*
 13 *P. globulifera* (*Turn.*), *Nyl.*
 f. discoidea (*Ach.*), *Nyl.*
 14 *P. multipuncta* (*Turn.*), *Nyl.*
 15 *P. amara* (*Ach.*), *Nyl.*
 16 *P. ophthalmiza*, *Nyl.*
 17 *P. reducta* *Strm.*
 18 *P. dealbata* (*Ach.*), *Nyl.*
 f. corallina (*L.*).
 19 *P. lactea* (*Schær.*), *Nyl.*
 20 *P. pustulata* (*Ach.*), *Leight.*
 21 *P. melaleuca* (*Sm.*), *Leight.*
 22 *P. lactescens*, *Mudd.*
 23 *P. Wulfenii*, *D. C.*
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 γ glabrescens, *Nyl.*
 24 *P. lutescens* (*Hjfm.*), *Nyl.*
 25 *P. leioplaca* (*Ach.*), *Schær.*
 26 *P. glomerata* (*Ach.*), *Schær.*
 27 *P. carneopallida*, *Nyl.*
 28 *P. xanthostoma*, *Snmrf.*
 29 *P. inquinata* (*Ach.*), *Fr. fil.*
 30 *P. nolens*, *Nyl.*
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 32 *P. fastigiata* (*T. & B.*), *Leight.*

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AUSTRALIAN FUNGI.

(Continued from p. 47.)

Trabutia phyllodiæ, Cke. & Mass.

Perithecia innate, convex, brown, 4 to 10, seated on orbicular stromatoid spots, pierced with a pore at the apex, for some time covered by the discoloured cuticle. Asci clavate-cylindrical, octosporous. Sporidia oblong, straight or very slightly curved, continuous, grumous within, $20-24 \times 10 \mu$, paraphyses numerous, slightly tinged with brown.

On phyllodes of *Acacia longifolia*. Victoria (*Martin 582*).

Sphærella nubilosa, *Cke.*

Hypophyllous. Spots orbicular or confluent and irregular, glaucous brown, soon falling away. Perithecia numerous, very minute (40-60 μ diam.), scarcely visible to the naked eye, depressedly globose, membranaceous, brown, pierced at the apex. Asci clavate, 8-spored, sporidia fusiform, 2-4 nucleate then uniseptate, hyaline, $16 \times 3 \mu$.

On living leaves of *Eucalyptus*. Victoria (*Martin* 584).

Erinella lutea, *Phil.*

Gregarious or scattered, shortly stipitate, cupulate, clothed at first with short whitish hairs, which become yellow, then yellowish brown; margin at first inflexed, then when moist erect; hymenium orange-yellow; asci broadly clavate, narrowing to an obtuse point at the summit; sporidia 8, linear, multiseptate, $76-102 \times 5-6 \mu$; paraphyses slenderly filiform.

On the bark of a tree, growing in the crevices of the bark, often in rows. Victoria, Australia.

The cups are $\frac{1}{2}$ to 2 lines broad; the stem short, stout, glabrous, and usually dark-brown, sometimes nearly absent. The hairs are about $60-70 \times 3-4 \mu$, slightly granular (in No. 368 septeate); the asci are $105 \times 15-17 \mu$.

This is near *Erinella mniopsis* (Ell.), Sacc., and *E. calospora*, Pat. and Gaill., but differs from the first in its straight, yellow brown hairs, and from the last, not only in the colour of the hairs, but in the stouter sporidia and slenderer paraphyses.

Ombrophila trachycarpa, *Phil.*

Subgregarious, sessile, concave, glabrous, wrinkled horizontally on the exterior, margin even, somewhat incurved; firm, cartilaginous-gelatinous, dark red-brown throughout, paler within; asci cylindrical, narrowed near the base; sporidia 8, elliptic, tending to fusiform, furnished with one large guttule, granulated on the surface, $20-25 \times 10-14 \mu$; paraphyses rather stout, enlarged at the summits, septeate.

On sandy ground amongst mosses, probably growing on their protonema. Victoria, Australia.

Cups $\frac{1}{4}$ to $\frac{3}{4}$ of an inch in diameter; asci $202 \times 14 \mu$. This is a close ally of *O. terrestris*, but the rough sporidia alone separate it from that species.

Phyllosticta Platylonii, *C. & M.*

Spots irregular on both surfaces, pallid, with a narrow brown margin. Perithecia on the under surface, very minute, membranaceous, rather prominent sporules minute, hyaline, $3 \times 1 \mu$.

On living leaves of *Platylonium*. Victoria (*Martin* 591).

Glœosporium pestiferum, *Cke. & Mass.*

Pustules gregarious, subcuticular, small, discoid, convex, rose. Conidia oozing out and forming pink nodules resembling a small *Tubercularia*, cylindrical, rounded at the ends, straight, continuous granular within, hyaline, $14-15 \times 3-4 \mu$.

On twigs, peduncles, and fruit of *Vitis vinifera*. Brisbane (*F. M. Bailey* 881).

Very destructive to vines.

***Marsonia deformans*, Cke. & Mass.**

Epiphyllous. Pustules gregarious, often confluent, brown, distorting the foliage, convex or flattened, sometimes on large indeterminate, discoloured spots. Conidia oblong, uniseptate, constricted at the septum, hyaline, $15-16 \times 5 \mu$.

On cultivated peas, chiefly on the leaves, stipules, petioles, etc. Victoria (*Martin* 593).

TWO JAPANESE EDIBLE FUNGI.

We have been somewhat surprised to receive a copy of two numbers of a Botanical Magazine from Japan, which contain descriptions of two new species of edible fungi, by Mr. N. Tanaka, accompanied by two excellent and characteristic coloured plates, not in the style of Japanese, but in that of European art. The descriptions are as follows:—

“In Japan Hatsudake has a very wide range of growth, and is one of the common edible fungi, highly appreciated almost all over the country. It appears chiefly in pine woods, and in great abundance in early autumn, previous to many other edible species; hence the name of ‘Hatsudake’ or ‘first fungus.’ In the vicinity of Tokyo it grows abundantly at Matsudo and Kogane, in the province of Shimōsa. In its season it is sold in vegetable markets in small shallow baskets made of bamboo. In preparing it for the market the lower portion of the stalk is cut off, and the pileus placed upside down in the basket. Each basket contains about twenty or thirty of the fungi, and the whole is covered with large fresh leaves, such as those of *Lappa major*, to prevent the fungi from drying. Of these fungi thus exposed to sale we can distinguish two different species, one of which is the ordinary Hatsudake, and the other an allied species commonly called ‘Akahatsu.’ They are often put together in one basket, and are collectively called by the common name of ‘Hatsudake;’ but they can easily be distinguished one from the other by the difference in colour of their gills. Akahatsu is much inferior in its taste to Hatsudake; hence its market value is also much less than that of the latter.

Although these fungi were already described by our old writers in many botanical works, yet their systematic position has yet been unsettled. Hatsudake and Akahatsu can easily be recognized to be species of *Lactarius* by their general characters, and especially by their milky gills. On account of this well-marked character and its esculent nature, Hatsudake has been confounded with *Lactarius deliciosus* (L.), Fr., by different writers. The specific characters of Hatsudake, Akahatsu, and *Lactarius deliciosus* (L.), Fr., are as follows:—

1. **Lactarius Hatsudake**, *Tan.*—Pileus fleshy, 1-10 c.m. broad, at first hemispherical, then expanded, umbilicate, viscid, zoned, smooth, dirty brown and slightly tinted with pink; margin smooth, at first incurved; stem stuffed, then hollow, pinkish, pruinose, subequal, short, 1-3 c.m. long; gills decurrent, often branched, rather broad, broadest in the middle, purplish brown, then bluish; juice aromatic, dull pinkish brown; spores echinulate, nearly spherical or ovoid, subhyaline, 8-10 μ in diameter.

2. **Lactarius Akahatsu**, *Tan.*—Pileus fleshy, 2-8 c.m. broad, at first hemispherical, then expanded, umbilicate, viscid, absolutely zoned, smooth, yellowish red, then pale; margin smooth, at first incurved, paler, at length slightly repand, rather thin and acute; stem 1-4 c.m. long, nearly equal, curved, stuffed, then hollow, yellowish, pruinose; gills decurrent, orange, then greenish, rather thin (narrower than those of *L. Hatsudake*), broadest in front; juice orange, aromatic; spores echinulate, nearly spherical or ovoid, subhyaline, 9-11 μ long and 6-8 μ in diameter.

3. **Lactarius deliciosus** (*L.*), *Fr.*—Pileus fleshy, 2-11 c.m. broad, convex, umbilicate, viscid, zoned, smooth, reddish-yellow, then pale; margin smooth; stem 8 c.m. long, stuffed, then hollow, rather spotted; gills subdecurrent, yellowish, then pale, when bruised green, juice aromatic, reddish-yellow; spores spheroid, echinulate, subhyaline, 7-8 μ in diameter, or 9-10 μ long and 6-8 μ broad. Colour variable; pileus sometimes zoneless.

By comparing the above descriptions it is evident that the three fungi are quite distinct from one another, and we recognize a much closer resemblance between the second and third rather than between the first and second or first and third.

As no species of *Lactarius*, which has the characters perfectly coincident with either Hatsudake or Akahatsu, has yet been described, I consider both of them to be new species, and deem it convenient to distinguish them by their native names.

A Japanese species of *Lactarius*, under the name of *L. lividatus*, B. & C., is given in Saccardo's *Sylogæ*. It closely resembles Hatsudake in its characters, but it is placed in the tribe Russularia, the species of which have white milk at first, while Hatsudake has dull purplish brown milk.

As regards the structure of Hatsudake, it is to be observed that groups of broad roundish cells appear to be set in a web of slender elongated hyphæ. The large-celled groups are sharply defined from the strands of slender hyphæ. In transverse section, especially in the stem, the cells of many of the large-celled portions are ovoid or wedge-shaped, and are so arranged as to form a rosette; other groups show two rosettes. The small circular centre of the rosette is formed by an elongated hypha, which runs longitudinally through the groups of large-celled tissues. The groups of large-celled tissues become fewer and smaller towards the under surface of the pileus. The laticiferous tubes run through

the strands of fine hyphal tissue, but without entering the large-celled groups. They are found especially in the fine hyphal tissues, near the under surface of the pileus, and in the trama, where they spread very much and are often branched; in the stem they are usually found in the outer region. These tubes are thicker than the surrounding hyphæ, and are filled with brownish turbid latex. They often send out numerous strong branches in every direction, and the stronger branches again send out short and delicate branchlets with slender closed extremities. The foregoing account agrees very well with Prof. De Bary's statements in regard to the structure of *L. subdulcis*, Fr. The subhymenial tissue is composed of small isodiametric cells, which show by their arrangement that they are members of the interwoven hyphæ. The hymenial layer itself consists of the terminal cells of the subhymenial hyphæ, closely packed together and placed vertically to the surface. The larger number of these cells develop into basidia; the rest remain sterile and form the paraphyses. When the basidium has reached its full size, the sterigmata make their appearance on its rounded apex; and when they have arrived at a certain length, their extremities swell into a vesicle, which gradually acquires the form, size, and structure of a mature spore. The basidium is filled with finely granulated protoplasm, but as the spore advances to maturity the protoplasm of the basidium passes into it, and after the isolation of the spore the basidium at length becomes almost empty. The number of sterigmata borne on a basidium is two or four. The mature spore is spherical or ovoid, 8-10 μ in diameter.

As regards the structure of Akahatsu, it agrees in the main with that of Hatsudake; but the basidia, paraphyses, and spores of the former are much larger than those of the latter."

BRITISH THELEPHOREI.

(Continued from p. 30.)

STEREUM. *Fries.*

Hymenium definitely inferior, coriaceous, intermediate stratum fibrillose, distinct from the inodermicous pileus, even, smooth, unchangeable; spores continuous, hyaline or olive.

I. MESOPUS. *Pileus rather funnel-shaped, stem distinct, central, rarely obsolete.*

Stereum Sowerbei (*Berk.*). *Mass. Thel.* 104. *Thelephora Sowerbeii*, *Berk. Outl.* p. 266. *Cooke Handb.* No. 890. *Stev. B. F.* II., 261. *Elvella pannosa*, *Sow. t.* 155.

Snowy white, infundibuliform, soon discoloured, acutely scabrous above (1-2 in. high), stem variable, distinct, or confluent at the base, hymenium smooth; spores ellipsoid, hyaline, 5 \times 4 μ .

On the ground.

Stereum multizonatum, Berk. & Br. *Ann. Nat. Hist.* III., t. xv., p. 321, pl. 13, f. 4. *Mass. Mon.* 107. *Cooke Handb.* No. 891. *Stev. B. F.* II., 262.

Pileus multiplex, infundibuliform, variously lobed, arising from the confluent stems, bright reddish flesh colour above, many times zoned with darker zones, margin lobed and crenulate; hymenium ribbed, paler, smooth; spores ellipsoid, hyaline, $8-9 \times 4-5 \mu$.

On the ground. Epping.

II. **PLEUROPUS**. *Pileus spatulate and fan-like, attenuated at the base into a more or less distinct stem.*

No British species.

III. **APUS**. *Pileus dimidiate, sessile, or at first resupinate, then effusely reflexed, marginate.*

Stereum hirsutum, Fries *Hym. Eur.* 639. *Mass. Mon.* 181. *Hussey I.*, pl. 58. *Sow. t.* 27. *Cooke Handb.* No. 911. *Stev. B. F.* II., 268.

Coriaceous, pileus effused and reflexed, strigosely hairy, rather zoned, becoming pale, margin rather obtuse, yellow; hymenium even, smooth, naked, without juice; yellowish ochre, with varying shades; spores globose, 5μ diam.

On trunks and branches. Common.

var. **subcostatum**, Karst. *Hedw.* 1881, p. 178.

Hymenium naked, vaguely costate; yellowish white, bright flesh colour or gilvous at the base.

On trunks.

Stereum ochroleucum, Fries *Hym. Eur.* 639. *Mass. Mon.* 184. *Stev. B. F.* II., 267.

Pileus coriaceous, rather thick, free, expanded, flaccid, silky, zoned, hoary white; hymenium even, smooth, becoming yellowish, cracking when dry; spores ellipsoid, or subglobose, $8 \times 6-7 \mu$.

On wood and bark.

Stereum purpureum, Pers. *Obs. Myc.* II., 92. *Fr. Hym. Eur.* 639. *Mass. Mon.* 186. *Cooke Handb.* No. 910. *Huss. I.*, pl. 20. *Sow. pl.* 388. *Stev. B. F.* II., 268.

Coriaceous, soft; pileus effusely reflexed, rather imbricate, zoned, coarsely tomentose, pallid or whitish; hymenium naked, even, smooth, purplish; spores ellipsoid, $7-8 \times 4 \mu$.

On trunks, branches, etc.

Stereum sanguinolentum, Fries *Hym. Eur.* 610. *Mass. Mon. Thel.* 189. *Grev. Sc. Crypt. Fl. t.* 225. *Cooke Handb.* No. 913. *Stev. B. F.* II., 269.

Coriaceous, thin; pileus effused and reflexed, adpressedly silky, rather striate, pallid, margin acute, white; hymenium even, smooth,

grey then brownish, bleeding when bruised, pruinose when old ; spores cylindrically elliptic, slightly curved, $8.9 \times 4.5 \mu$.

On pine and other wood.

Stereum disciforme, *Fries Hym. Eur.* 642. *Mass. Mon. Thel.* 189.

Rather coriaceous, white ; pileus resupinate, disc-shaped, determinate, margin thin, free, naked ; hymenium unequal, powdery ; spores subglobose, $16-18 \mu$ or $18 \times 15-16 \mu$.

On oak.

Stereum spadiceum, *Fries Hym. Eur. p.* 640. *Mass. Mon. Thel.* 190. *Cooke Handb. No.* 912. *Stev. B. F. II.*, 268.

Coriaceous, pileus effused and reflexed, villose, somewhat ferruginous ; margin rather obtuse, white ; hymenium smooth, tawny when growing, bleeding if wounded ; spores ellipsoid, $8 \times 5 \mu$.

On trunks. Common.

Stereum rugosum, *Fries Hym. Eur. p.* 643. *Mass. Mon. Thel. p.* 191. *Cooke Handb. No.* 914. *Stev. B. F. II.*, 240.

Corky, rigid ; pileus effused and shortly reflexed, obtusely marginate, at length smooth, bay brown ; hymenium unpolished, pruinose, rather bleeding when wounded ; spores cylindrically elliptic, obtuse at each end, $10-12 \times 4.5 \mu$.

A. hymenium yellowish.

B. hymenium livid grey.

On trunks. Common.

Stereum vorticosum, *Fries Hym. Eur. p.* 639. *Mass. Mon. Thel. p.* 194. *Stev. B. F. II.*, 268.

Pileus coriaceous, effused and reflexed, obscurely zoned, strigosely hairy, pallid ; margin of the same colour ; hymenium rather veined, smooth, purplish ; spores ellipsoid, $7 \times 4 \mu$.

On bark and wood.

Intermediate between *S. purpureum* and *S. hirsutum*.

IV. RESUPINATI. *Adglutinate, effused ; margin not, or scarcely, free.*

Stereum rufum, *Fries Hym. Eur.* 644. *Mass. Mon. Thel.* 198. *Stev. B. F. II.*, 271.

Between coriaceous and cartilaginous, erumpent, tuberculiform, then somewhat rounded, marginate, rufous, becoming brownish, smooth beneath ; hymenium pruinose, grey, at length bullate and tuberculose, finally cracking ; spores ellipsoid, $6.7 \times 4 \mu$.

On bark of lime. Scotland.

Stereum Pini, *Fries Hym. Eur.* 643. *Stev. B. F. II.*, 271.

Pallid, coriaceous, cartilaginous, adnate as a shield, rather

marginate, smooth beneath, at length bullate; hymenium purple flesh colour, then fuscous, pruinose; spores $6 \times 4 \mu$.

On pine bark.

Stereum frustulosum, *Fries Hym. Eur. p. 643. Mass. Mon. Thel. p. 199. Stev. B. F. II., 270.*

Woody, resupinate, tuberculose, crowded and somewhat confluent, then apparently broken into frustules, beneath and obsoletely marginate circumference smooth, bay brown, turning blackish; hymenium convex, cinnamon, growing pale, pruinose; spores ellipsoid, rather acute at the ends, $4-5 \times 3-3\frac{1}{2} \mu$.

On wood and bark.

Stereum acerinum, *Fries Hym. Eur. p. 645. Mass. Mon. Thel. p. 202. Cooke Handb. No. 915. Stev. B. F. II., 271.*

Crustaceous, adnate, even, smooth, snowy white; often sterile; spores ellipsoid, $6 \times 3-4 \mu$.

On living bark of *Acer campestre*, etc.

Stereum stratosum, *Berk. & Br. Ann. Nat. Hist. ser. V., vol. XII., (1883), p. 574. Mass. Mon. Thel. p. 203. Stev. B. F. II., 271.*

Effused, bright ochraceous-white, smooth, becoming yellowish, here and there rugose; substance pallid, stratose, the strata at length separating.

On bark (?). Penzance.

CONFESSIONS OF A MYCOPHAGIST.

A disinterested spectator at one of the Fungus Forays, now habitually organized by local Natural History Societies, will recognize three distinct classes of individuals which make up the marauding band. They all start with the single object in their minds of having a social day in the hunting field. It is to be a hunt, on a small scale, a sort of travestie of the bigger hunts of more aristocratical renown, but much of the old spirit of the chase gives life to the Foray. There is a dash of enthusiasm and excitement, a hope and a struggle to be "in at the death." The most interested of the three parties is generally the smallest one, composed for the most part of steady-going old fogies, with books in their pockets, and a basket on their arms, directing a keen restless gaze in all directions, quiet and reserved in their demeanour, but evidently meaning business. This is the scientific section, each individual of which is on the hunt for something new or rare, anything, ever so minute, which is capable of bearing a long name never heard in that locality before. Little regard is paid to the

scores of familiar forms scattered over the ground; familiarity seems to breed contempt; it is not the known, but the unknown, they are in search of, and the only service they seem to be to the general company is that of a court of appeal, a peripatetic store-house of Latin names, to be called upon whenever required, but alas too often incomprehensible and unsatisfactory to the inquiring spirit. The second class consists of what an old hand calls the "pot-hunters," those who look upon all fungi as divided into the edible and the useless, and whose ulterior object for the day is confined to the prospect of a mushroom breakfast for the following morning. The third class is made up of the ladies, who have joined the excursion because it is a novelty, or out of curiosity to discover what forays are like, or for some other reason concealed in the feminine breast; and young men, whose chief occupation is to pick off the "burrs" and disentangle the briars from the dresses of the ladies, supplemented by the Society officials, and such of the Society members as make it a rule to patronize all excursions, irrespective of their object, for the sake of the Society. We may dispense with any further allusion to the third class, and the first class is competent to take care of itself, but the second class includes the most promising elements, and cannot be so summarily dismissed. It has been very much the custom for scientific fungus-hunters, that is, those who participate in fungus excursions for scientific purposes, to under-rate and depreciate those who disavow all scientific interest, and confine themselves to the utilitarian object of fungus eating. This is manifestly an error of judgment, since the ranks of the former are mostly recruited from those of the latter. Let an illustration suffice. Very many years ago it was my good fortune to be introduced to an East Anglian gentleman who resided in a small agricultural village not ten miles from Norwich. I had been invited to give a gossiping lecture to the rustics in the schoolroom, and was asked to take a preliminary tea with the squire. It soon became manifest that the hobby of my host was "edible fungi," a subject of which I was then profoundly ignorant, but I became greatly interested in the discovery that there were other fungi beside the mushroom which might be eaten, and I had the pleasure of looking over his portfolio of coloured drawings, and hearing his explanations and encomiums. This was my first inspiration to turn my attention to "toadstools." I had never seen them before, or at least with an appreciative eye, and the subject came upon me as a revelation. At first I did, as so many others have done, restricted my interest to their edible qualities, and had no ambition beyond being able to recognize, collect, and devour some half-dozen different kinds of "toadstools," which, in all my surroundings, I had been taught to regard as "rank pi'sen." Since that eventful evening I have never abandoned the pursuit, and it has been my solace for more than forty years.

The first addition to my gastronomic list was a fortunate one, because it was a good one, but rather unfortunate, in another sense,

because it was somewhat rare in its occurrence in my neighbourhood. This was a "parasol mushroom" (*Agaricus procerus*). I could never remember to have seen such a thing before; indeed, I could not conceive it possible that I should, within a few days, go by appointment with my host to a small "spinney" half a mile away, and return with two specimens in my hands. This mushroom has such a distinct personality, its appearance becomes so fixed in the mind, without a rival to compete or be confounded with it, and its esculent quality is of such a high order that it would be impossible to name a better species for a novice to commence with. There is another reason why this is a most favourable species with which to commence fungus eating; it has a similar flavour to the mushroom, but not so strong. Some other kinds which could be named hardly suggest a mushroomy flavour, and, as far as I can gather, from my own experience, and that of others, the novice, making his first departure from the beaten track, will always compare the new esculent with the old one, and bring it into rivalry with the mushroom. Afterwards, when experience teaches that there are excellent fungi, with flavour peculiar to themselves, and like nothing else, they will habitually cease to institute comparisons, but at the outset it seems inevitable that he should do so. Most of my fungus-eating friends are of opinion that if all edible fungi were arranged in three classes, representing the excellent, good, and moderate, that the parasol mushroom would, with the true mushroom, and some score of others, occupy the first class. Indeed, I know of one, certainly a competent judge, who ranks it superior to the mushroom, if not at the head of its class. It would not be possible to find amongst those who favour mushroom food an individual who has not a very high opinion of it as a breakfast delicacy, although stronger flavoured species may be preferred as a condiment.

There is another mushroom (*Agaricus rachodes*) so nearly like the parasol that it is sometimes almost impossible to distinguish them. Berkeley himself says that "intermediate forms occur, which it is difficult to refer to either species." All this serves but to strengthen my conviction that there is really no specific difference, and yet for a long time an opinion was current amongst fungus eaters that the *rachodes* form was unwholesome. One writer says "it is not so good for food as *procerus*, if really wholesome;" and others have distinctly uttered cautions against it as unfit to be eaten. Another illustration of "give a dog a bad name, etc." for there is really no appreciable difference between them as esculents, and Mrs. Hussey was of the same opinion when she wrote: "If *procerus* is the king of edible funguses, *rachodes* is an excellent viceroy." Anyone who devotes attention to edible fungi will, in course of time, come round to the conviction that a great deal of romance has come to be associated with suspected species; for some slight reason or other somebody is led to doubt a certain species; then someone else, without further evidence, expresses a grave suspicion; this feeling intensifies, and a new author, with

some assurance, declares the suspected one to be absolutely unwholesome, and another "bogie" is set up, to maintain its position until some other more practical person, who does not take his cue from tradition, puts the suspicion to the test, and discovers it to be groundless. There could not well be a more ridiculous assumption than that of the unwholesome character of *rachodes*, which "chaste as ice, could not escape calumny." I am convinced that when the number of unwholesome fungi is reduced to its lowest denominator, it will not be, by any means, an imposing figure. During the past forty years a great deal has been done to clear away the insensate prejudice against "toadstools," but much still remains to be accomplished, for a bad reputation will cling to persons and things for a long time, even when the grounds for the accusation have been demonstrated "not proven." Both these forms of mushrooms are included by botanists in the sub-genus *Lepiota*, of which there are 36 British species, and I do not believe that a single one is unwholesome.

My mentor always impressed upon me, as I have endeavoured to impress upon others, the desirability of cultivating the habit of making coloured sketches of all the edible fungi, as a guide for future reference. The period of their appearance is so short, and there is no mode of drying and preserving them that is at all satisfactory, so that the only method of maintaining a record, and keeping up the continuity from season to season, is by means of water-colour sketches. The objection always urged against carrying out this plan is the declared want of hand power, the inability to make good drawings. Admitting this to be true, it is not, therefore, prohibitory, since anyone may acquire confidence, and ultimately proficiency, by adopting the plan which I adopted myself when I first commenced the study. Take a perfect specimen of the fungus, and cut it with a sharp, long-bladed knife through the middle of the cap and stem, longitudinally, to the base. This will give two equal halves of the fungus. Lay one of the halves, flat cut surface downwards, upon a sheet of white paper, and with a sharp-pointed hard pencil trace the outline upon the paper with the right hand, whilst the left keeps the half fungus in its position, so that it does not slip. When you have traced it all round, keeping the point of the pencil close to the edge of the fungus, the latter may be removed, and an outline will be left on the paper of the exact size and proportions of the original. A few details will then require to be added by hand, such as the ring round the stem (if it has one), and the line from left to right edge of the cap, indicating the lower edge of the cap. After a little practice such an outline may be made with great facility. Then follows the process of colouring, taking care to *match* the colours as nearly as possible, and not have them too bright. Shading is an after consideration, and may be resorted to when the power of drawing is more developed. All scales or marks on cap or stem should be indicated. Side by side with this sketch another should

be made in like manner, with either of the sections. This would represent the cut surface, or section through the centre of the fungus. In this case, also, some details will have to be added by hand. If the stem is hollow, that hollow must be drawn, so again a curved line from the stem to the edge of the cap, showing where the gills join the flesh, and consequently the width of the gills, especial attention being given to the manner in which the gills are attached to, or free from, the stem. The colour of the gills, and also of the flesh, can be added. This method will give two representations, one of the external appearance of the mushroom when growing, the other of a longitudinal section through the centre. All that remains to be done will be to add the name, the place where found, and the date. Other particulars which are not represented in the drawing would be added in writing, viz. : If growing on the ground, or on wood ; if dry, or viscid ; if with any odour, or none ; if pleasant to the taste, or tasteless ; and the colour of the spores, bearing in mind as of the utmost importance whether the stem is solid or hollow, and how the gills approach the stem. By following these instructions a person wholly unpractised in drawing may in a little time make excellent, though perhaps formal, sketches, and ultimately acquire sufficient confidence and power over the hand to execute freehand drawings without the tracing, although the tracing will always probably be acceptable for obtaining the section. No one need make the excuse that they are unable to execute drawings of *Agaricus* when this purely mechanical method is capable of being adopted, and if any artistic feeling is present in the operator it will soon be manifest in the sketches, which will cease to become mechanical.

M. C. C.

OMITTED DIAGNOSES.

We fail to find the following in Saccardo's Sylloge.

Peziza obvelata (*De Lacr.*). *Rabenhorst, Fungi Europaei, No. 432.*

Ascomatibus sub epidermide nidulantibus, inter nervos foliorum seriatis, approximatis, rarissime confluentibus, ceraceo-mollibus, minutissimis, ore subconstrictis, parum apertis, primo rubellis, dein fusciscentibus, disco concolore thecas octosporas 0.04 m.m. longas, 0.005 m.m. latas fovente ; sporis ovatis, obtusis, biocellatis, 0.008 m.m. longis, 0.002 m.m. latis. Hypophylla, sub-epidermoidea, ad Caricem hirtam Sti Romani ad Vignennam in territorio pietav. legebat de Lacroix, pater.

Sphæria (subtectæ) Juniperi (*Duby*). *Klot. Herb. Myc., No. 1833.*

Sparsa aut gregaria rarius conferta epidermide fissâ primo tecta dein in omnino expulsa nuda receptaculis atrobrunneis globosis opacis superficialibus, ostiolo minutissimo, thecis grossis clavatis

sessilibus sporas 8 ovatas pellucidas simplices aut rarius 1-septatas globulis minutissimis 4-5 fardas fiventibus, paraphysibus 0. In monte Salevâ prope Genevâ ad Juniperum emortuum cajú foliorum fere omnium paginam superiorem raro inferiorem infar- ciebat.

Sphæria fusispora (*Duby*). *Klot. Herb. Myc., No. 1832.*

Gregaria aut elongato-seriata demum confluentis primo tecto demum epidermide disrupta emergens, receptaculis nigris opacis globoso-depressis et etiam collapsis nunc solitariis nunc in series digestis et tunc difformibus, ostiolo nullo, paraphysibus nullis, thecis claviformibus, sporas 8 fusiformes utrinque attenuatas virescentes 1-septatas 2-seriales fiventibus. Ad caules emortuos Clematidis. Affinis *S. Dulcamaræ* a qua caracteribus laudatis differt et etiam *S. Panacis* Auct. non Fries (quæ *Diplodia*).

Scarcely like *Melogramma vagans*, to which it has been referred.

Sphæria (Obturatoria) Rhododendri (*Ces.*). *Klot. Herb. Myc., No. 1836.*

Forsan erit qui ad *Sph. protusum* (Fr.) vel *obturatum* (Ejnsd.) ducere velit. Sed donec non innotuerit exacte fructificatio singularium Sphæriarum simplicium in plurimis speciebus determinatio æquivoca. In nostra, cujus specimina eheu! nisi pro maxima parte vetusta et diffracta legere contigit, ascos cito evanescere puto, sporidia ovoideo-oblonga hyalina simplicia linquentes. Perithecia perfecta sub-globosa ostiolum minutum quidem sed distinctum papillæforme præbent.

Helotium pezizoideum, *Cke & Phil.*

Scattered, sessile, cupulate becoming plane, somewhat repand; hymenium orange yellow, externally white or pallid; asci cylindraceo-clavate ($70 \times 7 \mu$); sporidia 8, fusiform or oblongo-fusiform, straight or slightly curved, $7-12 \times 2 \mu$, paraphyses slenderly filiform.

On dead wood, amongst mosses. Waitaki, New Zealand.

Helotium scutellatum, *Kalch. & Cooke.*

Scattered, sessile or subsessile, plane, fleshy, umbilicate, margin obtuse; exterior slightly furfuraceous, hymenium the same colour; asci cylindraceo-clavate ($101 \times 11 \mu$); sporidia 8, oblongo-elliptic, tinged with brown, pseudo-septate, $16-19 \times 5 \mu$, paraphyses filiform.

On dead coriaceous leaves. Cape of Good Hope. (*MacOwan.*)

Cups nearly a line broad, resembling in colour the leaf on which they grow.

Helotium Venezuelianum (*Klot.*), *Phil.*

Gregarious, cupulate, becoming plane or repand, umbilicate, glabrous, 1 line broad; stem flexuous, as long as the breadth of the cup; yellowish tan colour throughout; asci clavate ($60 \times 7 \mu$); sporidia 8, oblong or oblongo-fusiform, $8-10 \times 2-3 \mu$. Paraphyses slenderly filiform. *Peziza Venezueliana*, Klotzsch in Kew Herbarium.

On decorticated wood. Venezuela.

Phialea furfuripes (*Berk. & Curt.*), *Phil.*

Cæspitose or solitary, stipitate, cupulate, brown, glabrous, except the stem, which is clothed with short, simple, cæspitose hairs; asci cylindrical, tapering near the base ($80 \times 8 \mu$); sporidia 8, sphaerico-elliptic, $5-6 \times 4 \mu$; paraphyses slenderly filiform.

On rotten wood. Venezuela. (*Herb. Berk.*)

Cups $\frac{3}{4}$ of a line broad; total height, 1 line.

Lachnella Morthieri, *Cke.*

Scattered, stipitate; cups at first urceolate, then cupulate, pale yellow, clothed with short, septate, colourless hairs, which have a knob at the summit; asci clavate ($25-30 \times 3 \mu$); sporidia 8, fusiform, $5 \times 1 \mu$, paraphyses not seen.

On dead stems of *Senecio Fuchsii*. Switzerland. (*Morthier in Herb. Kew.*)

Cups 30μ broad, stem about 15μ long.

Lachnella asema, *Phil.*

Scattered, minute, sessile, at first globose, then expanded, patelliform, white, or dirty-white, clothed with short, colourless, obtuse, septate hairs (scarcely visible under a lens); asci broadly clavate, pointed or obtuse ($40 \times 7 \mu$); sporidia 8, fusiform or clavate, $10 \times 3 \mu$, paraphyses slenderly filiform.

On dead leaves of a *Carex*. Berrington, Salop, Britain.

The cups are about 30μ broad.

Lachnella brachytricha, *Cke. & Phil.*

Scattered, stipitate; cups at first nearly closed, then expanded, cupulate, pale brown, clothed with very short hairs, which with the asci are often deformed by irregular swellings; stem enlarging upwards into the cup, usually curved; asci cylindrical or clavate; sporidia 8, cylindraco-fusiform, $10-13 \times 2 \mu$, paraphyses slenderly filiform.

On decorticated twigs. (*Herb. Kew.*)

Cups $\frac{1}{4}$ to $\frac{1}{2}$ a line broad, stems equalling in length the width of cups. The ventricose swellings on asci and hairs are a peculiar character.

Lachnella Hispanica, *Cke. & Phil.*

Scattered, stipitate; cupulate, white, clothed with long flexuous, colourless hairs, often with angular heads of oxalate of lime; hymenium pale yellow; asci cylindraco-clavate; sporidia 8, narrowly fusiform, $10-13 \times 2-2.5 \mu$, paraphyses acerose, nearly as broad as, and longer than, the asci.

On dead stems of *Rumex suffruticosus*. Pico de Cancellas, Spain.

This much resembles *L. patula* (Pers.), but has rather larger sporidia, and the paraphyses are unusually large.

Lachnella Nilgherrensis, *Cke.*

Scattered, minute, sessile or subsessile, patelliform, externally white, clothed with slender, short, septate, colourless hairs; hymenium whitish-yellow; asci linear-lanceolate, $70-80 \times 6 \mu$;

sporidia 8, linear, acute at the ends, 3-5 pseudo-septate, straight or slightly curved ($26-35 \times 3 \mu$); paraphyses slenderly filiform.

On herbaceous stems. India. (*Herb. Berk.*)

Cups $\frac{1}{4}$ of a line wide.

Lachnella Emerici, *Berk. & Phil.*

Scattered, stipitate, or turbinato-stipitate, brown, or rufous, cupulate (1 m.m. diam.), clothed with longish, flexuous, brown hairs, often with globose heads, asperate; asci cylindraceo-clavate ($60 \times 4 \mu$); sporidia 8, linear-lanceolate, pseudo 1-septate, straight, $18-25 \times 2 \mu$; paraphyses acerose, slender, exceeding the asci.

On twigs. Neilgherries, India. (*Herb. Berk.*)

Bulgaria chalybea (*Berk. in Herb.*), *Cke. & Mass.*

Cespitosa, sub-stipitata, demum aperta, turbinata dein obconica, extus rugulosa, umbrina ($2\frac{1}{2}$ -5 c.m. diam.) subfurfuracea, disco concavo, chalybeo, margine acuto, ascis clavatis, tetrasporis, sporidiis monostichis ellipsoideis, fuscis, inaequalateralibus, $25-27 \times 10 \mu$, paraphysibus linearibus, hyalinis. *Bulgaria inquinans*, var. *chalybea*. Berk., Indian Fungi.

On wood. Darjeeling, India.

Bulgaria microspora, *Berk.*

Crowded or scattered; sessile, at first sub-turbinate, then expanded; hymenium plane or concave, umbilicate, wrinkled, shining, purplish-brown, black when dry; flesh gelatinous, wrinkled; asci cylindraceo-clavate; sporidia elliptic, narrowed at ends, brown, uniseptate, $6 \times 3 \mu$; paraphyses slenderly filiform.

Venezuela. (*Herb. Berk.*)

Ombrophila aurata (*Berk. & Rav.*), *Phil.* *Peziza aurata*, *Berk. & Rav.* in *Ravenel's Exs. Fasc. III.*, No. 37.

In clusters or single, at first closed, then concave, at length expanded, convex, with undulate margin, half an inch wide; young plants greenish yellow without, with the disc dark green; in age becoming fuscous, underside venose; asci clavate; sporidia 6 or 8, fusiform, hyaline, 5×2 ; paraphyses scarce.

On dead wood of *Acer*. South Carolina.

The thin flexuous cups (1 to 3 lines broad), the short tapering stem, and the yellowish green colour are marked characters. The asci are slender in the lowest third of their length, $30 \times 4 \mu$.

Ryparobius tenacellus, *Phil.*

Scattered, minute; at first cylindrical, then hemispherical, immarginate, white, glabrous, with a tough membranaceous epidermis; hymenium plane, or slightly convex; asci broadly clavate; sporidia 36, elliptic, hyaline, $12 \times 8 \mu$; paraphyses stout, enlarged at the apices, at first filled with large guttæ, then pseudo-septate.

On rabbits' dung. The Wrekin, Shropshire, Britain.

The asci are $70-80 \times 27-30 \mu$; the cells of the epidermis are 10μ in diameter, and are strongly adherent, as indeed is the whole of the pseudo-parenchyma; the paraphyses at the apices are 6μ thick. This species approaches *Ryparobius albidus*, Boud., but has larger asci and sporidia, and is quite white.

Patellaria lata (Berk.), Phil.

Scattered, plain, or slightly concave, hymenium dark brown, the distinct margin paler; asci clavato-lanceolate; sporidia 8, fusiform, with 4-5 guttæ, tinged brown, $25-30 \times 5 \mu$; paraphyses abundant, slenderly filamentous.

On twigs of some tree. (Herb. Berk.) Java.

Cup seated on the bark, $\frac{1}{2}$ a line broad, brown within.

Patellaria Carteri (Berk.), Phil.

Crowded, difformed, patellate, hymenium black; margin involute, brown-black, as is also the flesh; asci cylindrical, narrower at the base; sporidia 8, elliptic, brown, $10 \times 5 \mu$; paraphyses filiform, with enlarged, adherent, forked summits.

On dead decorticated wood. Bombay. (H. J. Carter.)

This is a large species, from $\frac{1}{2}$ to 2 lines broad.

Phacidium mirabile, Cooke.

Scattered; sub-superficial, at first lentiform, closed, then rupturing irregularly, exposing the dark brown hymenium; excipulum sub-membranaceous; asci clavate, somewhat acute at the summit; sporidia 8, linear, acute at the ends, straight or curved, hyaline, furnished with 2-8 guttæ, $35-50 \times 3-4 \mu$; paraphyses slenderly filiform, slightly enlarged at the apices.

On disused herbarium paper in "Cryptogames du Lyonnais." (J. J. Therry, No. 6,302.)

The receptacles are a $\frac{1}{4}$ to $\frac{3}{4}$ of a line broad; the asci are 95μ long by 10μ broad. The species is somewhat anomalous.

Phacidium luridum (Berk. & Curt.), Phil.

Congregated, often contiguous, at first covered by the epidermis, then erumpent, orbicular, black, rugose, at length opening irregularly at the top; hymenium concave, cinereous; asci clavate ($90 \times 5 \mu$); sporidia 8, oblong-ovate, simple, $10-14 \times 4 \mu$; paraphyses filiform, slender. *Patellaria lurida*, B. & C. Berkeley's Herbarium.

On twigs. Pennsylvania. (Dr. Michener.)

It has a distinct peridium which is not concrete with the epidermis, which it throws up as a serrated border.

Phoma coryphæ, Cke. & Mass.

Peritheciis laxè gregariis erumpentibus, conicis, basi insculptis, atris, papillatis ($\frac{1}{3}-\frac{1}{4}$ m.m.). Sporulis arcuè ellipticis, utrinque rotundatis, hyalinis, $12 \times 3 \mu$.

On palm petioles. Ceylon, 649.

The following also we fail to detect in Saccardo's "Sylloge":—

Peziza echinulata, Auerswald, Hedwigia, 1868, p. 136.

Propolis phacidioides, Fr. Syst. Myc. ii., 198.

Stic. is dryophila, Cke. & Ell., Grevillea v., p. 33, t. 75, f. 6.

Stictis coccinea, Fries Elen., p. 24.

Phacidium tetrasporum, Phil. Brit. Disco., p. 388.

Peziza dematiicola, B. & Br., Ann. Nat. Hist., No. 1070. Phil. Brit. Disc., p. 267.

CORDYCEPS HAWKESII, Gray.

BY M. C. COOKE.

In a memoir entitled "Notices of Insects that are known to form the bases of Fungoid Parasites," by Mr. Gray, of the British Museum, privately printed and distributed in 1858, there are two figures, with descriptions, of a species of *Cordyceps* not yet recognized in systematic books. That it has distinctive features there can be no doubt, and Mr. Gray, considering it to be different from the other Australasian species, applied to it the above name. This entomophyte is in many particulars readily to be distinguished from *Cordyceps Gunnii*, and like that it is found in Tasmania.

The entire length of the club, and its host, is from five to nine inches, of which the fertile club does not occupy an inch. It is cylindrical, slightly narrowed and truncate at the apex, dotted with the immersed perithecia. The stem is irregular, flexuous, from two to four inches long, but slender, and for a great part of its length clad with a fulvous woolly coating. It is not thicker than a straw in some specimens, and altogether of a much more slender habit than *Cordyceps Gunnii*. Two clubs arise together from the same spot in some instances, or from different parts of the same caterpillar, and occasionally there are three or four clubs on one individual. The internal structure is undoubtedly the same as in *Cordyceps*, but the dimensions of the sporidia are not named. The figures given are on Plate V., figures 10 to 12.

The specimens were obtained by Mr. Hawkes, in Tasmania, in the month of April, and after him the species has been named. It can scarcely be confounded with *Cordyceps Gunnii*, for the club is not nearly so thick or dark, and has a different form. The stem, besides being more slender, is irregular, contorted, and nodulose, besides being woolly. From *Cordyceps Robertsii*, again, it differs in the broader and shorter head, as well as in the character of the stem. A comparison of the figures of the two will show that there is no difficulty in distinguishing them. To the entomologist, an important difference from both the other species will be recognized in the clubs springing from any part of the body of the insect.

This species has not been noticed in recent mycological works, partly on account of the memoir in which it was recorded having been privately printed, and hence comparatively unknown, and partly from the absence of any definite technical description. Although *Cordyceps Gunnii* appears now and then in different localities in Australia, the present species has not as yet been recognized outside Tasmania.

We must, however, advert to the account which Mr. Gray has given of this entomophyte from his own point of view, and his opinion of the host upon which it establishes itself. "It bears,"

he says, "a great similarity to those of New Zealand, and from its manner of growth one is induced to suppose that the external plant also forces its way at once through the sandy soil, wherever the insect may happen to be situated in its burrow when overtaken by the effect of the internal development of the thallus (mycelium). Judging from the various lengths of the plant, this takes place at different depths from the surface; and it is sometimes evident that the two ends of the caterpillar, when so affected by parasites, are buried at uneven depths, thus the plant emerging at the anal portion in one example was apparently buried for three and a half inches, while that originating at the anterior part was not buried for more than two and a half inches, showing a difference of one inch between the two ends, and at the same time proving the justice of the opinion previously expressed in reference to the New Zealand entomophytes, that the plant takes its rise from the caterpillar while in a horizontal, or nearly horizontal, position. The specimens in general show that the stem above the surface (*i.e.*, between the earth and the fructification) did not exceed a half or a quarter of an inch in length; and the buried portion of the stem, it may be remarked, especially that nearest the surface, is covered with a quantity of fulvous woolly matter, which matter sometimes extends itself to the body of the caterpillar.

"The most curious feature, however, of this parasite is that it grows from various portions of the body of the caterpillar, and in this respect offers a great difference from that of the New Zealand kind. Various examples of this distinction are among the specimens sent by Mr. Hawkes to the British Museum. One exhibits two fungoid tubercles forcing their way through the head, two fungi growing from the same base on the side of the abdominal segments, and a short fungus proceeding from the anal segment posteriorly. Another specimen was apparently in the act of progressing head upwards, but which had been checked in its progress, and the fungus has thus grown from both its ends; yet the two plants had appeared above the surface of the earth near to each other. That from the head is about five and a quarter inches, while the one from the anal portion is eight and a quarter inches in length; the latter, however, proceeded from a short stem which had first, apparently, grown downwards before the plant turned towards the surface. The stem is irregular in its length, and in places is very woolly, especially the part near the surface, and is more so on the one from the head. Some of these caterpillars bear a fungus composed of a short stem at the base, which has evidently been broken, and has then given origin to several branches; these branches are more slender than where the plant consists only of a single stem throughout. The discovery of this species of parasite has dispelled the idea which had been entertained up to the present time that *Cordyceps Gunnii* was the only one to be found in Tasmania. A similar one, or perhaps the same species, is also found in Victoria.

"The caterpillar may be that of a species of *Pielus*, or of some

closely allied genus; but the perfect insect is unknown at present. The fungus was found in a sandy district, but the exact locality was not mentioned, and from its appearance it is not improbable that the mode of life and food of the caterpillar are extremely like those of the New Zealand entomophytes. It is, however, of a peculiar deep reddish purple colour, about three or four inches in length, partaking of the same form as the others; but the shields on the thorax differ. The prothorax is almost entirely covered; the mesothorax has a narrow shield, forming a crescent towards the anterior margin; the metathorax is only furnished with a very narrow crescent-shaped shield and a subquadrate spot on the side."

"FUNGI EXSICCATI" EXCESSES.

"Coming events cast their shadows before," and we fancy that we recognize the shadow of the coming collapse of general "Fungi Exsiccati," by internal evidence supplied by the collections themselves. For the old series by Desmazières, Mougeot, Klotzsch, and continuation, and Fuckel, there was a want at the time, which they supplied, and gave satisfaction. But nowadays the case is different, the number increases, and the quality deteriorates, so that at length there is sure to be an outcry of "no more exsiccati."

When the specimens issued are insufficient in quantity, and deficient in quality; when they are preserved and distributed in such an imperfect condition that additional labour has to be expended upon them to render them of permanent service; when the collections, one after the other, include the commonest species, over and over again; when the species, if of interest, is repeated, from the self-same locality, in three or four current sets; when the series are extended to such an inordinate length as to exceed the resources of the ordinary purchaser, then the end must be near. For limited series there may still be a market; for such as "Rehm's Ascomycetes" or "Phillips' Discomycetes," or "Plowright's Sphaeriacei" there was good and sufficient reason; but for an unlimited range over 40,000 species there is no excuse. We are led to these remarks by noting a few facts which have come within our own experience. Let us take a selection from these examples, and upon them we will leave a disinterested and unprejudiced mycologist to pronounce judgment.

Puccinia graminis, in one published series, is represented by Nos. 266, 267, 268, 319, 366, 427; in another series, by the same collector, are Nos. 116, 640, 2,019, 2,635, 2,638, and 3,022. In another collection, published simultaneously by another hand, the same species appears under Nos. 47, 526, 1,514, and 2,919.

Pleospora herbarum. In one series we find it under the following numbers: 179, 536, 537, 845, 1,160, 1,357, 1,921, 1,922,

1,923, 2,540, and 2,544; and in another series, 80, 178, 189, 686, 687, 688, 792, 895, 1,188, 1,283, 1,285, 1,599, 2,197, 2,747, 3,038, 3,436, 3,437, and 3,771. Other species nearly equal to these might be quoted, but supposing any individual purchasing all these series, would he not feel most reasonably annoyed at having to pay for sixteen specimens of *Puccinia graminis* and twenty-nine examples of *Pleospora herbarum*?

There is another aspect in which deterioration of value is manifest; we will suppose a new species, in some well-known genus, is issued in North America, and, of course, as such is welcomed, but it has become the practice now to recognize the same species from the same locality issued in two or three other exsiccati, and hence every such species has, as a penalty, to be paid for three or four times. Take:—

Entyloma menispermi, *Farl.*

Ellis, 1490. Winter, 3002. Roumeguere, 4032.

Glæosporium stenosporum, *E. & K.*

Ellis, 1631. Winter, 3689. Roumeguere, 3877.

Parodiella perisporioides, *B. & C.*

Ellis, 685, 1560. Winter, 3251. Roumeguere, 4051.

Chætomium olivaceum, *C. & E.*

Ellis, 56. Thumen, 1942. Roumeguere, 4930.

Venturia orbicula, *Schwein.*

Ellis, 700, 1687. Winter, 3143. Thumen, 855.

Sporidesmium rude, *Ellis.*

Ellis, 763. Thumen, 475. Roumeguere, 4591.

Massaria vomitaria, *B. & C.*

Ellis, 97. Thumen, 270. Winter, 3667. Rehm., 438.

Ophiobolus fulgidus, *C. & P.*

Ellis, 583. Thumen, 1742. Roumeguere, 4856.

Sphærella Magnoliæ, *Ellis.*

Ellis, 800. Winter, 2755. Roumeguere, 2453.

Sphærella convexula, *Schw.*

Ellis, 1674. Winter, 3257. Ravenel, 755.

Cercospora copallina, *Cooke.*

Ellis, 1505. Winter, 3682. Ravenel, 586.

Cercospora granuliformis, *E. & H.*

Ellis, 1753. Winter, 3683. Roumeguere, 3595, 4004.

Cercospora Demetrianæ, *Wint.*

Ellis, 1744. Winter, 3079. Roumeguere, 4488.

Cercospora personata, *B. & C.*

Ellis, 2480. Thumen, 1964. Roumeguere, 4689. Ravenel, 771.

Cercospora diantheræ, *E. & K.*

Ellis, 1750. Kellerman, 33. Roumeguere, 5190.

Microsphæra extensa, *C. & P.*

Ellis, 429. Thumen, 756. Winter, 3043. Ravenel, 625.

Microsphæra van Bruntiana, Ger.

Ellis, 1324. Winter, 3247. Rehm., 849.

Microsphæra Ravenelii, B. & C.

Ellis, 660. Thumen, 558. Rehm., 446. Ravenel, 87.

Uncinula macrospora, Peck.

Ellis, 426. Winter, 3244. Thumen, 2053.

Commercially this kind of thing is a failure. It is a depreciation of value, by increase of supply, and, in the end, must result in injury to all parties concerned. Already we hear warning notes of dissatisfaction, and these will assuredly ripen into measures of retaliation, which may take the form of reduction of at least two-thirds the number of "exsiccati" subscribed for. In these days, when there is a constant tendency to specialization, the only alternative left to those who supply sets of specimens will be to limit the length of the series, by restricting the issue to some definite section, such as Pyrenomycetes, Discomycetes, Gastromycetes, Uredines, Hyphomycetes, or Myxomycetes. The bulk of Hymenomycetes have never given entire satisfaction, and hence it would be a doubtful section to rely upon. If this division of labour, reduction of bulk, and limitation of expenditure should be resorted to it may command the market, but the last days of general collections are undoubtedly at hand.

M. C. C.

MEMORABILIA.

VALSARIA PARMULARIA (Berk.), Sacc. Syll. No. 2814.—Specimen so called in Roumeguère's Fungi Gallici, No. 4338, is not that species, which has sporidia $35\ \mu$ long, whereas in this they are only $15 \times 9\ \mu$, probably a form of *Valsaria rubricosa*, Fr.

EPICHLÖE HYPOXYLON, Peck., 27th Report, p. 108.—According to the specimen in Ellis and Everhardt's North American Fungi, this is identical with *Hypocrella atramentosa*, Berk. & Curt., in Saccardo Sylloge, No. 5066.

AGARICUS (GALERA) MUCIDOLENS, Berk. Lond. Journ., 1845, p. 301. Saccardo Sylloge, No. 3563.—This species was transferred in Berkeley's Herbarium to *Pluteus*, No. 806, and evidently belongs to *Hyporrhodii*. Spores $8 \times 5-6\ \mu$.

ILLUSTRATIONS OF BRITISH FUNGI.—Within a few days of the appearance of this journal, the last two parts of the "Illustrations" will be in the hands of subscribers, bringing the total number of plates to 1,198. The title page and index will also be found in the last part for the eighth volume. It is a source of unalloyed pleasure that this consummation has been attained, after the con-

tinuous labour of ten years. It is not a consolatory reflection that, partly from the defection and partly from the death of subscribers, the income has for the past two years fallen short of the expenditure. However, this is not a solitary instance of unrequited labour, and, if the author finds himself out of pocket at the close of ten years' working for nothing, he can only blame himself. Pressing invitations have been received urging the publication of a companion volume, which should include the whole of the *Polyporei*. No doubt this would be very convenient, but, at present, the reflections upon the past are not calculated to raise an enthusiasm for a similar future. It may be generous to work without hope or prospect of remuneration, but it is a luxury of which one becomes weary at last.

FUNGI OF AUSTRALIA.—Arrangements are in progress, and nearly completed, for the production, in one volume, octavo, of a text book for the Fungi of Australia, containing descriptions, in English, of all the genera and species, with plates, some plain and some coloured, illustrating all the principal genera and subgenera, as much as possible by means of Australian species. The separate governments have consented to the production of the work under their patronage and with their support. The bulk of the work has been prepared, and the printing will commence as soon as the preliminaries are finally determined. A few copies will be retained for sale in Europe, but the principal portion of the issue will be sent to the Colonies forthwith. It is confidently expected to be completed within twelve months.

EDIBLE BRITISH FUNGI.—The editor having, during the past winter, prepared a small popular volume on this subject, illustrated by coloured plates, it is hoped that arrangements will soon be completed for its publication, at a moderate price, in ample time for use in the coming season. The plates will contain about forty-four species, on twelve plates, and the letterpress, amongst other matters, will include full directions for cooking and serving the various dishes. In order to give full space for the esculent species, the poisonous kinds will be purposely excluded, as the author considers the usual course of including poisonous with edible fungi to be an objectionable one.

TWO AUSTRALIAN FUNGI.

BY M. C. COOKE.

We have received, through the kindness of Baron F. von Mueller, drawing and specimen of an Australian species of *Amanita*, which, in many points, is sufficiently remarkable for special notice. It was found near Bacchus Marsh, Victoria, by

D. Best, and is quite distinct from anything heretofore described. In colour it resembles the ordinary yellow form of *Ag. phalloides*, but there all resemblance ceases. The pileus is convex and hemispherical, but exhibiting no tendency to become flattened, and covered to the very margin with large obtusely pyramidical warts, or scales, like the scales of a "stone pine." Not, as in most species, the remains of the volva, but large persistent scales, into each of which the flesh of the pileus enters, and the cuticle follows all the inequalities of the projections, which are in some cases a centimetre broad at the base, where they are hexagonal in outline and touching each other. The diameter of the pileus is from three to four inches, with an incurved margin. There is no evidence of viscosity, and no tenacity in the cuticle when moistened. From *Ag. ananæps* it differs in having the scales continued to the extreme margin, in their larger size, greater solidity, and in not being superficial, but persistent. The external appearance is somewhat that of *Polyporus Ellisii* from the United States, or, indeed, from the character of the scales, almost any of the species of *Strobilomyces*, except in colour. The stem is short, about an inch thick, and rather attenuated upwards, four inches long or more, a little obtusely turbinate at the base, and the volva closely adnate and marginate, deeply sulcate with four or five deep furrows, directed downwards, around the slight bulb. The ring is superior and rather small, whilst the stem is solid and firm, a little paler than the pileus. The gills rather narrow and free, not much crowded, leaving a channel around the top of the stem. Spores quite different from *Ag. ananæps*, the only species to which it approximates. It will be seen from the above description that this is really a peculiar species, which, in drying, becomes quite hard, without any of the flaccidity or premonition of decay common to *Amanita*. The following will be its diagnosis:—

***Agaricus (Amanita) strobilaceus*, Cooke.**

Pileus convex, hemispherical (3-4 in. diam.), pale lemon yellow, covered with large persistent, obtusely pyramidical warts, or scales, after the manner of a fir cone, down to the extreme margin, which is incurved. Stem short, stout, solid, slightly incrassated at the base (4 in. \times 1 in. or more), ring superior. Volva closely adnate, circumscissile, marginate, longitudinally sulcate. Gills rather narrow, not crowded, free, leaving a channel round the stem. Spores small, hyaline, $5 \times 2\frac{1}{2} \mu$.

On the ground. Victoria.

We hope, by arrangement with the Government Department of Victoria, to give coloured figures of this and other Victorian Agarics, in subsequent numbers of this journal.

The other fungus worthy of notice is also remarkable in a different manner, as it belongs to quite a different order of fungi, the *Pyrenomyces*. It is in reality a superficial *Sphaeria*, with a remote resemblance to the old *Sphaeria ovina*, but sulphur coloured,

covered with a mealy, pulverulent hairy coat, and hence now called *Lasiosphæria*. The most noteworthy circumstance lies in the character of the fructification, which is remarkably fine, consisting of long, spindle-shaped sporidia, with from 15 to 19 septa. At first the perithecia are so concealed by the mealy coating that it is difficult to determine what sort of a fungus it is, or whether it is a fungus at all. It occurred on bark near Macedon, Victoria, and was discovered by that energetic lady, to whom we have been indebted for many good things, Mrs. W. Martin (*née* Flora Campbell).

***Lasiosphæria larvæspora*, Cke. & Mass.**

Perithecia superficial, loosely gregarious ($\frac{1}{2}$ - $\frac{1}{3}$ m.m. diam.), globose, covered with a mealy floccose sulphur-coloured investment, with a naked pierced ostiolum. Asci cylindrically clavate, octosporous. Sporidia elongated, fusiform, straight or flexuous ($160 \times 10 \mu$), at first nucleate, then multiseptate (15-19), hyaline.

On bark. Macedon, Victoria. (No. 566.)

MUSHROOMS AND TOADSTOOLS.

Having had occasion recently to obtain a census of edible and noxious fungi, it may prove acceptable to record some of the figures obtained in this investigation. It may be premised that Saccardo's "Sylloge," which professes to have brought together all the descriptions of species from all parts of the world, enumerates 4,600 species of *Agaricini*, and this is assumed to be the total number of gill-bearing fungi hitherto described. Out of this total the "Reprint of Handbook," just completed for this group of fungi, enumerates 1,400 British species, so that more than one-fourth of the entire total have been found in these islands. It was our object to obtain some guide to the proportions of edible and noxious fungi in this total, and, as a first step, we discovered that 134 may be relied upon as edible, but against these we have no positive evidence that more than 30 are poisonous. It is necessary to analyze the total 1,400 species a little before we draw inferences, and in pursuit of this we discovered that—

Species too minute to be of any service, as	
esculents	580
Species found only once or very rare...	130
Species too coriaceous, as <i>Lenzites</i>	10
	<hr/>
	720

By this means we discover that slightly over one-half of the total number of British species must be left out of account, so

that we have only to discover, or estimate, the number of poisonous or edible species in a total of 680, of which we know 134 to be good eating. The balance of 550 species is apparently a very considerable one for uncertainty, and it would be very satisfactory if it could be reduced.

To our minds the 125 species of *Cortinarius* might be set aside as not decidedly poisonous, but not common enough to be of any general interest. Then about 30 large species of the *Hyporrhodii* are not accounted for. We have such a lurking suspicion of this section, that we had rather believe them noxious than make any attempt to eat them. On the other hand there are 27 *Hygrophori*, and at least 50 *Leucospori*, which we could believe in so much as not to decline to test them; most probably fifty of these would be agreeable eating even if 27 were simply innocuous. After all it seems most probable that we have 200 species of *Agaricini* which could be eaten with impunity. No one cares to experiment at all freely with treacherous material, but having regard to affinities, to analogous odour and absence of acidity in the raw state, it seems highly probable that the number might, without risk, be increased to some 200 species of British edible fungi. Many that are not included in our definite list of 134 species have been tried by ourselves and found harmless, but we desire to try them again before recommending them to others. We shall be glad of any suggestions of species not already included in our list when it is published.

SPORE DIFFUSION IN PHALLOIDEI.

An interesting discussion has been proceeding for some weeks in the pages of "Nature" on "Attractive Characters in Fungi." It is not our intention in this place to intervene in that discussion, but to follow a suggestion tending in another direction. It is to be noted that the old assumption is not dead, that the spores of fungi do not germinate direct, but must previously serve a probation in the stomach of some animal, where they undergo some change which induces fertility. There was a period, undoubtedly, when many persons held this belief, and some hold to it still, simply because it has been held, and not from any evidence. As far as we are aware there never has been any evidence for this belief, beyond a mere assumption, and *that* only in respect to the common mushroom. It was observed that horse droppings, packed together, yielded spawn, which, under favourable conditions, produced mushrooms. The inference was that the horse had devoured the mushrooms in order to give the spores a warm lodgment in its intestines, and ensure germination. Hence, that the spores so treated became fertile, assuming that otherwise they were

not fertile ; ultimate conclusion, that the spores of fungi must pass through the body of some animal or they will not germinate.

Undoubtedly this is all a romance, with no other basis than the above supposition, and devoid of any sustaining facts. On the contrary, Mr. Worthington Smith demonstrated that spores of *Coprinus* germinated readily on dung and its juices, although innocent of any intestinal journey. An error is a long time in dying out, and this one is most tenacious of life, although it has been contradicted over and over again.

It is nearly two years since that Mr. Wemyss Fulton communicated a paper to the "Annals of Botany" on "The Dispersion of the Spores of Fungi by the agency of Insects, with special reference to the Phalloidei." Perhaps no one really doubted that the fætid odour, prevalent in this order, was attractive to flies ; it was known pretty generally that the large flies congregated about the *Phallus*, and revelled in its dark green slime at the period of its maturity, but it had not been demonstrated by experiment that the voided spores were either fertile or sterile. It was shown, therefore, that the spores of *Phallus impudicus* having passed through the body of a fly, would germinate, and had not been injured in the transmission. "As to the action of the spores on the fly, there was no deleterious effect. They lived for about three weeks on this food and then died, and, as was to be expected, no subsequent change occurred in their bodies." As to the effect of the ingestion of the spores upon the spores themselves, it was found that they germinated and produced mycelium without apparently having suffered injury. No one is at liberty to assume that the spores had been rendered fertile by ingestion, and that it was essential to their germination that they should pass through the stomach of a fly. No such inference is drawn in the paper alluded to, and, as far as we see, no other suggestion than "insects are normally the disseminators of the spores of *Phallus impudicus*, and that this fact serves to explain, not only the peculiar liquefaction of the hymenium, but many other points in its structure, and furnishes, indeed, the clue to the curious and often *bizarre* forms of other Phalloids which have so often puzzled botanists to explain."

An allusion is made in this paper to the species of *Coprinus*, in which genus it is known that the gills are deliquescent, falling away in black, inky drops, fully charged with the spores. It is assumed that a fætid odour is prevalent in *Coprinus*, whereas such is not the case until decay is considerably advanced. The proportion of fætid species is not greater in *Coprinus* than in any other genus or sub-genus of gill-bearing fungi, and should not be mentioned in company with the *Phalloidei*. Neither could we ever discover that they were exceptionally subject to the visitation of insects. On this point, however, we should be glad to hear of the results of systematic observation. We note, however, the following : "In some cases, from the radial fissuring and the curling up of the pileus, combined with peculiarities of colouring, a curious

superficial resemblance to the flowers of some Compositæ may be recognized, the unchanged, often brownish centre, representing the disc, and the radiate marginal part the rays. This partial mimicry may possibly be accidental and without advantage, but it is worth noting that the great majority of those species which are markedly revolute, or what I may call flower-like, grow on dung where flies are abundant, while of those which possess neither of these characters well marked, the majority do not grow on dung as a rule." Is not this merely fanciful? Although the flies abound on the dung, are they to be seen sucking the black juice from the pileus, as in the *Phalloidei*, and if so, at what period of the day? since we have never been fortunate enough to catch them at it; so that we fail to appreciate the conclusion, that "considering all these facts in relation to the *Coprini*, the assumption is certainly warranted that they exhibit adaptations for the purpose of having their spores transported by insects." On this point we have an open mind, but although we have watched, often and long, we cannot confirm insect visitation to the deliquescent gills of *Coprinus*.

NEW BRITISH FUNGI.

(Continued from p. 41.)

Hypocrea (Broomella) leptogicola, Cke. & Mass.

Stroma orbicular, convex, pruinose, flesh-coloured, become hard when dry ($\frac{1}{2}$ -1 m.m. diam.), parasitic on thallus of *Leptogium*, ostiola obsolete, asci clavato-cylindrical. Sporidia fusiform, acute at the ends, 5-septate, hyaline (37 - $40 \times 6 \mu$).

On *Leptogium*, growing upon *Robinia*. Kew.

Stuartella Carlylei, Cke. & Mass.

Perithecia gregarious, large, carbonaceous, globose, superficial ($\frac{3}{4}$ m.m. diam.), black, tuberculate, as in *Bertia moriformis*, pierced at the apex, not papillate; asci clavately cylindrical, sporidia lanceolate, five septate, not constricted, brown, 40 - 50×8 - 10μ .

On naked wood. Carlisle. (Dr. Carlyle.)

Mollisia dactyliogluma, Cooke.

Cups soft, fleshy, concave, then flattened, $\frac{1}{4}$ - $\frac{1}{2}$ m.m., white, cinereous, or livid, paler at margin, sessile, smooth. Asci cylindrical, sporidia cylindrical, rounded at the ends, nearly straight, hyaline, $10 \times 1\frac{1}{2} \mu$.

On glumes of *Dactylis glomerata*. Lynn.

Lachnella stigmella, Cooke.

Cups shortly stipitate, white, or pale flesh-colour, clad with thin flexuous hairs, one-tenth m.m. diam., disc of the same colour; asci cylindrical. Sporidia 8 - $10 \times 1 \mu$, paraphyses fusiform.

On rushes. Norfolk.

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Grevillea.

A QUARTERLY RECORD OF CRYPTOGAMIC BOTANY
AND ITS LITERATURE.

AUSTRALIAN FUNGI.

By M. C. COOKE.

(Continued from p. 62.)

Agaricus (Leptonia) melanurus, Cke. & Mass.

Pileus campanulate, subumbonate, then expanded, shining black, cracking radiately (2 c.m. broad). Stem cylindrical (5-6 c.m. long, 2 m.m. thick), swollen abruptly at the rooting base, greyish, with black striæ. Gills reaching the stem, lanceolate, pallid, then pinkish, margin blackish with a line of large dark cystidia, with one to three blunt teeth at the apex. Spores subglobose ($7 \times 5 \mu$).

On the ground. Oakleigh, Victoria.

Agaricus (Pholiota) disruptus, Cke. & Mass.

Pileus convex, fleshy, creamy white, at first smooth, then cracked deeply into large areolæ, especially about the fleshy disc (8-10 c.m. broad), margin incurved. Stem elongated, cylindrical, expanding into the pileus, sometimes slightly swollen at the base (10 c.m. long, 10-15 m.m. thick), same colour as the pileus, hollow, striate, cracking, and subsquamulose, with a strong cord-like mycelium. Ring narrow, pendulous. Gills adnate, rather ventricose, broad, not crowded, dull pinkish white, then umber. Spores elliptical, tawny brown, $14 \times 9 \mu$.

On the ground. Victoria. (Mrs. Martin, 613.)

Allied to *Ag. pulchus*.

Agaricus (Flammula) veluticeps, Cke. & Mass.

Pileus convex, then flattened, depressed in the centre, densely and shortly velvety, bay-brown (3-4 c.m. broad), margin involute. Stem expanded upwards into the pileus, stuffed, rather short (3 c.m. long), smooth, of the same colour as the pileus (5 m.m. thick). Gills rather distant, attenuated behind, and deeply decurrent, orange brown, then umber. Spores orange brown, minutely apiculate at the base ($12 \times 5 \mu$).

Amongst grass on the hillsides. Omeo, Victoria. (Baron F. v Mueller, H.)

Boletus (Subtomentosi) brunneus, Cke. & Mass.

Pileus pulvinate, convex, subtomentose, at length cracking into innate scaly patches (10-12 c.m. broad), reddish brown. Stem short, thick, attenuated upwards (7 c.m. long, 5 c.m. thick at the base), colour of the pileus, striate with black, flesh whitish, blue when cut, at length brown. Tubes free, pores rather large, angular, greenish grey. Spores $14-15 \times 4 \mu$, olive.

On the ground. Victoria. (Mrs. Martin, 611.)

Corticium penetrans, Cke. & Mass.

White, effused, incrusting, thick, soft, closely adnate, immarginate; with a profuse penetrating floccose mycelium. Hymenium continuous, even, smooth, chalky. Spores pip-shaped, $9 \times 7 \mu$.

On rotten wood, etc. Sorrento, Victoria. (Mrs. Martin, No. 635.)

Resembling *C. portentosum*, but with different spores.

Didymosphæria Banksiæ, Cke.

Epiphyllous, spots orbicular, pallid, with a nebulous brown margin; perithecia few, central, erumpent by cracking the cuticle, black, subglobose, papillate. Asci clavate, sessile, octosporous; sporidia biseriata, uniseptate, the upper cell nearly globose, the lower cell rather narrower, brown, $10 \times 5 \mu$.

On living leaves of *Banksia*. Victoria. (Martin, 685.)

Microthyrium amygdalinum, Cke. & Mass.

Perithecia gregarious or scattered, on both surfaces, superficial, and soon falling away, lenticular, membranaceous, very dark brown, with a radiating cellular structure, pierced in the centre; asci clavate, sporidia without order, elliptical, attenuated towards each end, uniseptate, hyaline, $14 \times 7 \mu$.

On living leaves of *Eucalyptus amygdalina*. Spencer's Gulf. (Walt. Gill.)

Communicated by Baron F. v. Mueller.

Conisporium pterospermum, Cke. & Mass.

Pustules gregarious, small, erumpent, elliptical, or elongated, blackish, mycelium forming a kind of pulvinate stroma, from which arise short hyaline sporophores, conidia apical, subglobose or oblong in outline, becoming discoid when free, with a membranous margin, expanded into about six truncate projections, each of which is concave at the apex, spore body globose, continuous, olive-brown, 12μ , including the membranous expansion in one plane 25μ .

On *Lepidospermum*. Victoria. (Martin, 778.)

Cercospora Kennedyæ, Cke. & Mass.

Epiphyllous. Spots cinnamon brown, irregular and confluent. Tufts scattered, black, punctiform, resembling a *Venturia*, erumpent. Threads fasciculate, simple, flexuous, sometimes nodulose, septate, pale olive. Conidia cylindrical, slightly attenuated upwards, three septate, hyaline olive ($40 \times 3 \mu$); as long, or rather shorter than the threads.

On leaves of *Kennedyia prostrata*. Victoria. (Mrs. Martin, 603.)

Cercospora epicoccoides, Cke. & Mass.

Epiphyllous. Spots small or confluent, purple, tufts gregarious. sphaeriform, rather compact, black, resembling an *Epicoccum*, threads very short, simple. Conidia profuse, fasciculate, cylindrical, slightly attenuated upwards, 3-5 septate ($50 \times 5 \mu$), pale olive.

On *Eucalyptus* leaves. Victoria. (Mrs. Martin, 600.)

Stilbum corallinum, Cke. & Mass.

Cæspitose, flesh-coloured, stems attenuated upwards, branched, with short branches, mealy; capitulum hemispherical, or rather irregular, subglobose, orange-red. Conidia elliptical, continuous, hyaline ($5 \times 2 \mu$).

On bark. Victoria. (Mrs. Martin, 607.)

Aposphæria leptospermi, Cke.

Perithecia scattered, erumpent, then superficial, minute, black, papillate, white within. Sporules minute, oval, hyaline, $3 \times 1 \mu$.

On bark of *Leptospermum*. Victoria. (Mrs. Martin, 680.)

Dothiorella amygdali, Cke. & Mass.

Perithecia innate, botryose, transversely erumpent, black, opaque, not papillate, rather gelatinous when moist. Sporules elliptical, hyaline, granular within ($22-25 \times 8-10 \mu$), on rather thick basidia of equal length.

On bark of peach and almond. Victoria. (Mrs. Martin, 672.)

Septoria lepidospermi, Cke. & Mass.

On both surfaces, spots greyish, then white, oblong, with a broad brown margin. Perithecia small, semi-immersed, black, seated on the spots. Sporules linear, flexuous, hyaline, $30 \times 1 \mu$.

On leaves of *Lepidosperma*. Victoria. (Mrs. Martin, 779.)

Melophia phyllachoroidea, Cke.

Perithecia scattered, on both surfaces, convex, flattened at the base, and scutate, black ($\frac{1}{2}$ -1 m.m. diam.), white within, even, smooth. Sporules thread-like, curved or flexuous, hyaline, 25μ long.

On leaves of *Leptospermum lævigatum*. Victoria. (Martin, 701.)

Leptostromella eucalypti, Cke. & Mass.

Spots suborbicular, on both surfaces, red brown, then fuliginous; perithecia scattered over the spots, minute, subglobose, then elongated, black, dehiscing by an elongated fissure. Sporules thread-like, straight or flexuous, 20μ long.

On fading leaves of *Eucalyptus*. Victoria. (Martin, 682, 714.)

Stylospores of *Ailographum*?

Glœosporium nigricans, Cke. & Mass.

Without distinct spots, on both surfaces. Pustules densely aggregated, becoming black, convex, at length pierced; conidia oval, hyaline, $12 \times 7 \mu$.

On leaves of *Eucalyptus pauciflora*. Australian Alps. (C. Walter.)

Communicated by Baron F. v. Mueller.

Glœosporium citri, Cke. & Mass.

Gregarious, erumpent, pale fuliginous. Pustules rather small, often confluent, cuticle splitting irregularly above; conidia obtusely fusiform, on short sporophores, at first nucleate or granular, hyaline, $20 \times 5-6 \mu$.

On branches of lemon. Victoria. (Mrs. Martin, 638.)

Glœosporium epicladii, Cke. & Mass.

Pustules gregarious, in the centre of irregular spots, caused by the blackened cuticle, with a central pallid pore, through which the contents emerge in an orange subgelatinous mass. Conidia fusiform, obtuse, hyaline ($22-25 \times 9-10 \mu$), with granular contents.

On *Cladium tetraquetrum*. Port Phillip. (C. French). Communicated by Baron F. v. Mueller.

Eurotium lateritium, Mont.

Sporidia $6-7 \mu$ diam.

On leaves of *Peperomia*. Mount Bartle Frere. (Stephen Johnson.) Communicated by Baron F. v. Mueller.

Entyloma eugeniarum, Cke. & Mass.

Sori in irregular dark brown pustules, which are flattened, rounded or confluent and then angular ($\frac{1}{2}$ m.m.), collected in large hypophyllous patches. Spores globose, oblong, or angular ($10-20 \times 10-12 \mu$). Epispore very thick, even, pale brown.

On leaves of *Eugenia*. Brisbane, 891.

ADDITIONS TO DÆDALEA.

By M. C. COOKE.

The enumeration of *Dædalea* in Saccardo's "Sylloge" is deficient in a few species, mostly named by Berkeley, the descriptions of which we have not been able to discover, and hence they have been drawn up from the typical specimens. We should have thought it preferable to have followed the same course as adopted in *Trametes*, and have recognized a section for the few species which possess a scutate base. We have proposed no other alterations in the arrangement, although there are some two or three species included in *Lenzites*, which, in our opinion, should have found a place in *Dædalea*.

Dædalea Eatoni, Berk. in Herb.

Coriaceo-suberosa. Pileo flabelliformi vel dimidiato, confluyente vel imbricato (5 c.m. diam.), velutino, azono, sub-lævi, fusco-umbrino; contextu lignicolori; hymenio pileo saturatiore, lamellis

radiantibus, tenuibus, transverse anastomosantibus, acutis; sinulis rectis, inæqualibus, numquam flexuosis.

On trunks. Cape of Good Hope.

Dædalea subcongener, Berk.

Suberosa. Pileo dimidiato, applanato, velutino, pallido, ligni-colori, vel subfusco (6-12 c.m. diam.), concentrice sulcato, intus pallido, hymenio concolori, lamellis confertis, latis ($\frac{1}{2}$ -1 c.m.) sinulis confertissimis, flexuosis, angustissimis, dissepimentis tenuibus.

On trunks. Australia. Sierra Leone. Makua Country, Trop. Africa.

Dædalea flabellum, Berk. in Herb.

Rigido, coriaceo-suberoso. Pileo amplo, reniformi, vel flabellati, postice contracto, quandoque scutati, radiato, rugoso, lineato-zonato (20-25 c.m. diam.) cervino; margin tenui, crispulo vel sublobato. Hymenio alutaceo, lamellis radiantibus, furcatis, latis, sæpe anastomosantibus, dissepimentis tenuibus, rigidis, lacerato-dentatis.

On trunks. Rangoon, Andaman Islands.

Resembling *D. aulacophylla*, B., but thinner.

Dædalea Andamanni, Berk. in Herb.

Pileus coriaceous, coarsely strigose with flattened branched and serrate laminae, soft, brownish, fawn-colour (1-2 in. diam.), broadly effused behind and confluent, forming large resupinate patches (6-8 in. diam.), pores sinulose, crowded, narrow, with thin dissepiments, at length torn.

On trunks. Andaman Islands, Perak.

Dædalea Mulleri, Berk. (nec Trametes Mulleri, B.)

Pileus corky, rather thick, convex, narrowed behind, without zones, rugose or tuberculate, smooth, whitish (7-8 c.m. broad), margin rather acute, hymenium pale tan-colour, gills rather crowded, broad, thin, acute, forked and anastomosing, here and there porose, then parallelly sinulose.

On trunks. Victoria.

LACHNOCLADIUM.

It seems remarkable to those unacquainted with his own occult reasons, wherefore Saccardo has removed this genus from its manifest affinities in *Thelephorei* and placed it with *Clavaria*, with which, on the other hand, it has no relationship, except that of external form. Obviously the lateral hymenium, coriaceous substance, and dry persistent form, brings it into proximity with *Thelephora*, from some species of which *Lachnocladium* is scarcely separated. Surely it cannot consistently be maintained in *Clavariæ*.

NEW OR IMPERFECTLY KNOWN GASTROMYCETES.

By G. MASSEE.

Mutinus proximus, *Berk. in Herb.*

Entire fungus, 3-5 m.m. high; stem white, slender, wall with a single layer of cavities, externally alveolate; sporiferous portion about 4 m.m. long, subglobose, apex obtuse, imperforate, orange-red, and covered with olive mucus; spores colourless, elliptic-oblong, $3 \times 1 \mu$; volva ample, springing from cord-like white strands of mycelium.

On the ground. Peradenia, Ceylon. (Type in Herb. Berk., Kew.)

Lysurus Gardneri, *Berk. Hook. Lond. Journ. Bot.*, 1846, p. 535, t. xvii.

Berkeley, in describing the present species, says that the vertical lobes bearing the hymenium are united at the tips, and on this account the species has been removed to the genus *Colus*, by Fischer; but in reality the segments are not organically united at the tips, but during the young stage are closely pressed together, and having been dried in this condition appear to be united; however, when the mucilage is moistened the tips are found to be quite free, and are normally so in several out of the twenty-three specimens from Gardiner in the Kew Herbarium. The above is an average illustration as to how synonyms originate, *i.e.*, by manipulating descriptions and not specimens, which, however, answers the desired object, that of enabling the manipulator to bracket the founder's name and bring his own to the front.

Syn., *Colus Gardneri*, E. Fischer, in Sacc. Syll., Vol. vii., Pt. i., N. 63.

Cyathus Colensoi, *Berk. Fl. Tasm.* II., p. 192.

Densely crowded, cyathiform or subcylindrical, up to 1 c.m. high, wall thin, flexible, externally densely crowded with ochraceous-brown shaggy tomentum, becoming smooth with age, inside perfectly smooth and even, brownish; sporangiola blackish when mature, 2 m.m. diameter; spores colourless, elliptical, $8 \times 5 \mu$.

On the ground. New Zealand. (Type in Herb. Berk., Kew.)

Crucibulum simile, *Mass., n. sp.*

Crowded or usually scattered, subcylindrical, 6-7 m.m. high, becoming bell-shaped, and with the margin of the mouth revolute, externally densely covered with a very short, dull orange tomentum, internally whitish, smooth, even; sporangiola biconvex, white, 1 m.m. diameter; spores colourless, subglobose, small, $4 \times 3 \mu$.

On bark and wood. New Zealand, and Australia. (Type in Herb., Kew.)

Superficially resembling *Crucibulum vulgare*, but distinguished by the very much smaller and differently shaped spores.

Tulostoma Wrightii, *Berk. in Herb.*

Stem 6 c.m. high, 4 m.m. thick, hollow, equal, ochraceous, even, glabrous; peridium spherico-depressed, 2 c.m. broad, minutely umbonate, pale, ochraceous, glabrous, the wall of the umbo disappears at maturity and forms a small circular stoma; mass of spores yellowish-brown; threads of capillitium hyaline, thick-walled, aseptate, equal, very long, branched, axils lunate, $5\ \mu$ diam.; spores globose, pale yellow-brown, minutely warted, $5\text{--}6\ \mu$ diameter.

On the ground. Rio Grande, North Mexico. (Wright). (Type in Herb. Berk.)

Distinguished from *Tulostoma Myenianum* in the entire mouth and the hollow, even and not striated stem.

Tulostoma album, *Mass., n. sp.*

Stem 1-5 c.m. high, $\cdot 5$ m.m. thick, ochraceous, longitudinally wrinkled; peridium globose, minutely umbonate, white, glabrous and shining; mass of spores ochraceous-cinnamon; capillitium dense, threads hyaline, thick-walled, often branched, axils lunate, aseptate, variable in thickness, from $8\text{--}12\ \mu$; spores yellow-brown; globose, coarsely warted, $10\text{--}11\ \mu$ diameter.

On the ground. Israelite Bay, W. Australia. (Type in Herb., Kew.)

Resembling *Tulostoma brachypus* in habit, but differing in the pure white peridium and the small stoma with an entire margin.

Hydnangium nigricans, *Kalchbr.* (omitted from Saccardo), described in *Grevillea*, Vol. X., p. 107.

Hydnangium Tasmanicum, *Kalchbr. in Herb.*

Subglobose, 2-5 c.m. diameter; peridium thick, dark brown, rugulose when dry, sterile base entirely absent, cells of the gleba large, irregularly angular, 1-2 m.m. in diameter, septa thick, ochraceous, not splitting; basidia clavate, tetrasporous, sterigmata short, spores globose, brown, epispore thickly covered with large, irregular warts, $13\text{--}14\ \mu$ diameter.

On the ground. Tasmania. (Specimen from Kalchbrenner in Herb., Kew.)

Secotium leucocephalum, *Mass., n. sp.*

Small; stem 1-2 c.m. long, 3 m.m. thick, solid, equal, white, even, continued through the gleba as a columella that expands at the apex into the wall of the peridium, and gives off laterally several white branched plates; peridium hemispherical, umbilicate below, 1.5-2 c.m. across, white, smooth, even, becoming contracted and corrugated when dry; gleba orange brown, cells subequal, small, irregularly angular, septa thin; basidia broadly clavate, tetrasporous, sterigmata very slender, elongated, spores broadly elliptical, apiculate, distinctly warted, yellow-brown, $8 \times 5\ \mu$.

On the ground. New Zealand. (Type in Herb., Kew.)

Readily distinguished from all known species by the white stem and peridium, and the broadly elliptical warted spores.

Secotium Gunnii, Berk. in Herb.

Small; stem slender, 1.5 c.m. high, 3 m.m. thick, solid, equal or slightly incrassated downwards, pale brown, passing through the gleba as a columella and expanding at the apex into a thick wall; peridium 1.5 c.m. across, subglobose, deeply umbilicate below, pale brown, smooth; flesh of stem and wall of peridium whitish; gleba brown, cells small, irregularly polygonal; basidia clavate, tetrasporous, sterigmata very slender, elongated, spores obliquely elliptical, tips acute, smooth, pale reddish-brown, $7 \times 4 \mu$.

On the ground. Sulphur Springs, New Zealand. (Gunn.) (Type in Herb. Berk., Kew.)

Secotium erythrocephalum, Tul.

Basidia cylindraceo clavate, tetrasporous, sterigmata slender, elongated, spores elliptic-oblong, smooth, apiculate, pale yellow-brown, $10-11 \times 5 \mu$.

Gyrophragmium Texense (B. & C.), Mass.

Stem erect, 7-8 c.m. high, lower half incrassated and enclosed in an adnate volva that becomes free and fibrillose at the margin, solid, attenuated above the volva and expanding at the apex into the thick wall of the peridium, which is at first continuous with the volva, eventually breaking away in a circumscissile manner and forming an agaric-like pileus; trama consisting mostly of parallel lamelliform plates, rarely anastomosing laterally; lamellæ crowded, almost free from the stem or columella, about 1 c.m. deep, basidia clavate, tetrasporous, sterigmata very slender, elongated; spores cinereous-brown, subglobose, epispore thick, smooth, 4μ diameter.

Secotium Texense, B. & C., N. Amer. Fungi, Grev., Vol. ii., p. 34; Sacc. Syll., vii., Pt. i., No. 148.

On the ground. W. Texas. (Capt. Pope.) (Type in Herb. Berk., Kew, No. 4416.)

The present species closely resembles *Gyrophragmium Delilei*, Mont., and as a genus is distinguished from *Secotium* by the peridium breaking away from an outer portion of the stem that remains as a volva, and in the gleba having its septa arranged in a lamelliform manner instead of anastomosing to form an irregularly cavernous structure.

Calostoma æruginosa, Mass., n. sp.

Exoperidium even, becoming broken up into small, irregular and verdigris-green squamules; endoperidium subglobose, dingy green, 1-1.5 c.m. diameter, ostium red inside, margins of the 5 suberect, acute teeth, orange; spore-sac pale; spores elliptical, warted, pale yellow, $12 \times 6 \mu$; stem-like base, irregularly lacunose, dirty brown, 4-6 c.m. long.

On the ground. Beenak, Victoria, Australia. (Type in Brit. Mus.)

Considered by the late Mr. Broome to be identical with *Calostoma* (= *Mitremyces*) *viridis*, B., with which the present plant agrees in

colour, but is altogether much more slender, and at once recognized by the elliptical spores.

PROTOGLOSSUM, *Mass., nov. gen.*

Subterranean; peridium elongated, cylindrical, vertical, sometimes attenuated at the base into a very short stem-like portion, that is continued for a very short distance up the peridium as a rudimentary columella; peridium thick, continuous, indehiscent; gleba broken up into minute, irregularly angular or sinuous cavities, septa thick, firm, persistent, not splitting; basidia clavate, constantly bisporous, sterigmata rather thick, divergent, spores coloured.

Somewhat allied to *Cauloglossum*, but distinguished by being subterranean at maturity, the absence of a stem, columella rudimentary, bisporous basidia, and peridium not becoming broken up at maturity.

The present genus forms a transition from the truly subterranean genera, which it resembles in the large ornamented spores, and the above-ground forms, where the sterile base or columella becomes differentiated into a stem, as in *Secotium* and *Gyrophragmium*, and the spores become much smaller for the purpose of facilitating their dispersion by wind.

Protoglossum luteum, *Mass., n. sp.*

Peridium cylindrical, 5 c.m. high by 2 c.m. broad, growing vertically, with the extreme apex appearing above ground, and of an orange colour, the subterranean portion yellowish, smooth, even; cavities of gleba about 1 m.m. diameter; spores globose, orange-brown, epispore raised into prominent flattened ridges, that anastomose to form a polygonal network, 14 μ diameter.

Clarendon, Victoria, Australia. (Type in Herb., Kew.)

"In rich black mould, only mere trace of top above ground, orange-yellow, no stem."

GYMNOGLOSSUM, *Mass., nov. gen.*

Peridium entirely absent at every stage, the gleba consequently naked, subcylindrical, attenuated upwards, broken up throughout its entire substance into numerous large, irregular cavities, lined with large, clavate tetrasporous basidia, sterigmata elongated, slender, spores coloured; stem distinct, elongated, solid, passing up into the gleba for about half its height as a central columella.

Distinguished from *Protoglossum*, *Chuinoderma*, and *Cauloglossum* by the absence of a peridium at every stage of development, and also from the two last-named genera in the columella not reaching the apex of the gleba. Agrees with *Gautieria* in the absence of a peridium, but separated by the elongated gleba supported on a distinct stem, that enters for some distance as a columella, and in the tetrasporous basidia.

Gymnoglossum stipitatum, *Mass., nov. sp.*

Gleba obtusely conical, irregularly undulated and lacunose, pale brown, 5 c.m. high, 2 c.m. broad, stem about 1.5 c.m. high, 3-4 m.m.

thick, solid, whitish within, pale brown externally, continuing for about two-thirds the height of the gleba as a subflexuous columella; external cavities of gleba sterile, inner irregularly angular or flexuose, lined with basidia, spores elliptical, ends acute, smooth, olive-brown, $10 \times 6 \mu$.

On the ground. Moonan Brook, New South Wales. (Miss Carter.) (Type in Herb., Kew.)

An examination of the type specimen of *Sphæriceps lignipes*, Welw. and Curr., shows that this species is a typical *Battarreia*, hence the genus *Sphæriceps* must sink. The spores are subglobose, yellow-brown, and distinctly warted, $7-8 \mu$ diameter; the short elaters are equal in diameter to the spores, and contain annular or spiral thickenings.

TRAMETES AND ITS ALLIES.

By M. C. COOKE.

The genus *Trametes*, as interpreted by Saccardo in his "Sylloge" (vi., 334), seems to require some little rectification, and first, by the isolation of those aberrant forms for which we have already proposed the genus *Sclerodepsis*. (See "Grevillea," xix., p. 49.)

SCLERODEPSIS. Cooke.

Sclerodepsis Berkeleyi, Cooke Grev. XIX., p. 49. Sacc. Syll. 6209

Sclerodepsis colliculosa (Berk.), Sacc. Syll. 6237.

Sclerodepsis lobata (Berk.), Sacc. Syll. 6208.

Sclerodepsis Beyrichii (Fries), Sacc. Syll. 6201.

Sclerodepsis læticolor (Berk.), Sacc. Syll. 6191.

These are separated on account of the acute edge of the pileus, the acute dissepiments of the pores, which are sometimes toothed, characters incompatible with *Trametes*.

The residue of the genus would stand in something like the following relationship, although a few of the enumerated species are unknown to us:—

TRAMETES. Fries.

A. SCUTATÆ. *Postice basi scutata, substipitata.*

Trametes expallens, Fries. Sacc. Syll. 6160.

Trametes centralis, Fries. Sacc. Syll. 6161.

Trametes elegans, Spreng. Sacc. Syll. 6162.

Trametes marchionica, Mont. Sacc. Syll. 6163.

Trametes rhizophoræ, Reich. Sacc. Syll. 6164.

Trametes glabrescens, Berk. Sacc. Syll. 6165.

Trametes crenulata, Berk. Sacc. Syll. 6167.

Trametes sagreæana, Mont. Sacc. Syll. 6168.

Trametes Hookeri, Berk. Sacc. Syll. 6169.

Trametes phellina, Berk. Sacc. Syll. 6170.

B. *SESSILES*, Fries. *Omnino apodes, dimidiatae, crasso, suberoso.*

* *Contextu albo.*

Trametes gibbosa, Pers. Sacc. Syll. 6172.

Trametes rubescens, Fries. Sacc. Syll. 6173.

Trametes Bulliardi, Fries. Sacc. Syll. 6174.

Trametes serialis, Fries. Sacc. Syll. 6175.

Trametes suaveolens, Fries. Sacc. Syll. 6177.

Trametes inodora, Fries. Sacc. Syll. 6179.

Trametes ludificans, Cesati. Sacc. Syll. 6180.

Trametes Mulleri, Berk. Sacc. Syll. 6181.

Trametes Kalchbrenneri, Fries. Sacc. Syll. 6211.

Trametes sprucei, Berk. Sacc. Syll. 6185.

Trametes lactea, Fries. Sacc. Syll. 6186.

Trametes incana, Lev. (?) Sacc. Syll. 6187.

Trametes heteromalla, Cooke. Sacc. Syll. 6188.

Trametes glaberrima, Berk. & Rav. Sacc. Syll. 6375.

Trametes hololeuca, Kalch. Sacc. Syll. 5689.

Trametes ochroleuca, Berk. Sacc. Syll. 5236 = *Polyporus*
Brisbanensis, Berk. *Polyporus havanensis*, B. & C. Sacc.
Syll. 5242.

The only observations on this section would be as to the exclusion of *T. dermatodes*, Lev. (No. 6176), which is only a synonym of *Hexagonia sericea* (No. 6306), and not a good *Hexagonia*, but *Polystictus* (*Stuposi*), near 5704.

Trametes pura, B. & C., Sacc. Syll. 6182, is not a *Trametes*, but a *Polyporus* (*Anodermei*) of the section *Molles*.

Trametes ambigua, Berk., Sacc. Syll. 6184, should be retained as a *Dædalea*.

Trametes versiformis, B. & Br., Sacc. Syll. 6183, is subresupinate, and must find a place further on, as it has no affinities here.

Trametes socotrana, Cooke, Sacc. Syll. 6189, as well as *Trametes tristis*, Lev., Sacc. Syll. 6166, may be sought in *recedentes*.

Trametes Trogii, Berk., Sacc. Syll. 6171, is more in character with some other coriaceous species, allied to *Polystictus*, and should be associated with them.

** *Contextu pallido, ochroleuco, vel lignicolori.*

Trametes ochroflava, Cooke. Sacc. Syll. 6247.

Trametes devexa, Berk. Sacc. Syll. 6197.

Trametes ohiensis, Berk. Sacc. Syll. 6198.

Trametes conchata, Berk. Sacc. Syll. 6193.

Trametes Peckii, Kalch. Sacc. Syll. 6194.

Trametes lactinea, Berk. Sacc. Syll. 6204.

Trametes lævis, Berk. Sacc. Syll. 6205.

Trametes Dickinsonii, Berk. in Herb.

Trametes suberosa, Quel. Sacc. Syll. 6210.

Trametes rugosa, Berk. & Br. Sacc. Syll. 6250.

Trametes scrobiculata, Berk. Sacc. Syll. 6249.

The remaining species included by Saccardo in this section may be thus disposed of. *Trametes mexicana*, B. & C., and *Trametes zebrina*, Fr., have the substance too dark for this group.

Trametes Cookei, Sacc. Syll. 6202, is evidently an error, as it is not a true *Trametes*, and has already appeared under *Polystictus*, in its proper place, as *Polystictus acuta*, No. 5702.

The two species, *Trametes paleacea*, Fries, and *Trametes immutata*, Berk., would go into *recedentes*.

The remaining *T. vittata*, Lev.; *T. tegularis*, Lev.; *T. aphano-poda*, Reich., and probably *T. bicolor*, Berk., are coriaceous.

Trametes limitata, Berk., Sacc. Syll. 6207, is a *Polystictus* of the section *Scortei*.

The following will stand as the description of—

Trametes Dickinsonii, Berk. in Herb.

Pileo suberoso-lignoso, semi orbiculari, pruinoso, cervino (8 × 5 c.m.), sulcato-zonato, subtiliter rugoso, demum glabrato, contextu cervino, roseatineto; poris subangulatis, mediis ($\frac{1}{2}$ – $\frac{3}{4}$ m.m. diam.), dissepimentis crassiusculis, rigidis.

On trunks. Japan.

*** *Contextu fusco vel fulvo-ferrugineo.*

a. HYDNOIDEI. *Pileo strigoso.*

Trametes hydnoides, Sw. Sacc. Syll. 6219.

Trametes Feathermanni, Rav., Sacc. Syll. 6225, only a form of *T. hydnoides*.

Trametes hystrix, Cooke. Sacc. Syll. 6223.

Trametes fibrosa, Fries. Sacc. Syll. 6220.

Trametes crassa, Lev. Sacc. Syll. 6226.

Trametes Klotzschii, B. Sacc. Syll. 6277.

Trametes ocellata, Berk. Sacc. Syll. 6227.

Trametes adelphica, Cooke.

b. HISPIDI. *Pileo, hispido, velutino.*

Trametes hispida, Bagl. Sacc. Syll. 6216.

Trametes hispidula, Berk. & Curt. Sacc. Syll. 6235.

Trametes pyrrhocreas, Berk. Sacc. Syll. 6241.

Trametes Burchellii, Berk.

Trametes protracta, Fries. Sacc. Syll. 6217.

Trametes abietis, K. Sacc. Syll. 6218.

Trametes gallica, Fries. Sacc. Syll. 6215.

- Trametes fuscella**, *Lev.* *Sacc. Syll.* 6222.
Trametes mæsta, *Kal.* *Sacc. Syll.* 6231.
Trametes acuta, *Lev.* *Sacc. Syll.* 6232.
Trametes captiosa, *Mont.* *Sacc. Syll.* 6236.
Trametes auxea, *Berk.* *Sacc. Syll.* 6246.
Trametes mexicana, *Berk. & Curt.* *Sacc. Syll.* 6196.
Trametes odorata, *Wulf.* *Sacc. Syll.* 6214.
Trametes Wahlbergii, *Fr.* *Sacc. Syll.* 6244.
Trametes pertusa, *Fries.* *Sacc. Syll.* 6245.
Trametes Moritziana, *Lev.* *Sacc. Syll.* 6253.
Trametes umbrina, *Fries.* *Sacc. Syll.* 6242.
Trametes scleromyces, *Berk.* *Sacc. Syll.* 6255.

In this group *Trametes helvola*, *Fries.*, *Sacc. Syll.* 6233, was already entered as *Polystictus helvolus*, *Fries.*, *Sacc. Syll.* No. 5720.

Trametes cognata, *Berk.*, *Sacc. Syll.* No. 6234, is also *Polystictus* (*Coniacei*), and must be deleted.

c. Pileo pruinoso, subglabro.

- Trametes pini**, *Fr.* *Sacc. Syll.* 6213.
Trametes Guyoniana, *Mont.* *Sacc. Syll.* 6238.
Trametes kansensis, *Crag.* *Sacc. Syll.* 6239.
Trametes fusca, *Lk.* *Sacc. Syll.* 6221.
Trametes œthalodes, *Mont.* *Sacc. Syll.* 6230.
Trametes incondita, *Fr.* *Sacc. Syll.* 6248.
Trametes erubescens, *Schulz.* *Sacc. Syll.* 6252.
Trametes purpurea, *Cooke.* *Sacc. Syll.* 6254.
Trametes zebrina, *Fries.* *Sacc. Syll.* 6195.

*** *Contextu rubro.*

- Trametes punicea**, *Fries.* *Sacc. Syll.* 6258.
Trametes aurora, *Cesati.* *Sacc. Syll.* 6259.

Trametes cinnabarina (*Fr.*), *Sacc. Syll.*, 6257, already appears as *Polystictus cinnabarina*, *Sacc. Syll.*, 5711, and is therefore excluded.

c. INODERMEI. Pileo coriaceo, tenui.

- Trametes tristis**, *Lev.* *Sacc. Syll.* 6166.
Trametes Trogii, *Berk.* *Sacc. Syll.* 6171.
Trametes bicolor, *Berk.* *Sacc. Syll.* 6190.
Trametes vittata, *Lev.* *Sacc. Syll.* 6192.
Trametes tegularis, *Lev.* *Sacc. Syll.* 6203.
Trametes aphanopoda, *Reich.* *Sacc. Syll.* 6212.
Trametes actinopila, *Mont.* *Sacc. Syll.* 6229.
Trametes epitaphra, *Berk.* *Sacc. Syll.* 6240.
Trametes scalaxis, *Fries.* *Sacc. Syll.* 6243.

We have affirmed elsewhere that even upon the authority of the Rev. M. J. Berkeley, the species described as *Polyporus isidioides*, B., cannot be maintained as distinct from *Polyporus scruposus*. If such were not the case it could not rest as a *Trametes* in Sacc. Syll. 6228, and again as a *Polyporus* in Sacc. Syll. No. 5131. It has no claim to be regarded as a *Trametes*.

Trametes Petersii, Berk. & Curt., Sacc. Syll. 6250, is rather *Fomes* (*Lævigati*) than *Trametes*.

d. RECEDENTES. *Dissepimentis tenuibus, scissilis.*

Trametes socotrana, Cooke. Sacc. Syll. 6189.

Trametes paleacea, Fries. Sacc. Syll. 6206.

Trametes immutata, Berk. Sacc. Syll. 6207.

C. PLACODERMA, Fr. *Pileo crusta laccato tecto.*

Trametes skeleton, Fr. Sacc. Syll. 6260.

Trametes sclerodermea, Fr. Sacc. Syll. 6261.

Trametes balanina, Fr. Sacc. Syll. 6262.

D. SUBRESUPINATÆ. *Pileo subresupinato.*

Trametes versiformis, B. & Br. Sacc. Syll. 6183.

Trametes sepium, Berk. Sacc. Syll. 6200.

Trametes gausapata, Berk. & Rav. in Herb.

Trametes zollingerina, Lev. Sacc. Syll. 6224.

Trametes incerta, Curr. Sacc. Syll. 6256.

Trametes mollis, Fries. Sacc. Syll. 6264.

Trametes hexagonoides, Fries. Sacc. Syll. 6263.

Trametes epilobii, Karst. Sacc. Syll. 6265.

Trametes isabellina, Fr. Sacc. Syll. 6266.

Trametes serpens, Fr. Sacc. Syll. 6267.

Trametes campestris, Quel. Sacc. Syll. 6268.

Trametes serena, K. Sacc. Syll. 6269.

Trametes Terreyi, B. & Br. Sacc. Syll. 6270.

Trametes dædalioides, Klot. Sacc. Syll. 6408.

Trametes purpurascens, B. & Br. Sacc. Syll. 6271.

Trametes dibapha, Berk. Sacc. Syll. 6272.

Trametes Curreyi, Cooke. Sacc. Syll. 6273.

The description of *Trametes gausapata*, B. & R., does not appear to have been published.

Trametes gausapata, Berk. & Rav. in Herb.

Pileo basi effusis, reflexis, plerumque resupinatis, confluentibusque, velutinis, zonatis, tabacinis, coriaceis (1 unc. lat.) contextu fusco; hymenio pallide umbrino; poris demum angulatis, subacutis ($\frac{1}{2}$ m.m. diam.).

On trunks. United States, Madagascar, Australia.

Trametes Burchelli, Berk. in Herb.

Pileo suberoso-molli, velutini-villoso, convexo, lateraliter extenso, confluyente, umbrino-fulvo, pallescente (3-5 unc. long, 1 unc. lat.),

sæpe scruposo, contextu umbrino; tubulis elongatis (1 c.m.); poris angulatis, magnis (1-2 m.m.) pallide umbrinis, dissepimentis crassis.

On trunks. Brazil, Pegu.

Trametes adelphica, Cooke.

Pileo suberoso, subtenui, reniformi, applanato, vix zonato, nigro-fusco (3-10 c.m. diam.) setis rigidis, compressis, atrofusceis strigoso, margin acuto, glabrescente, intus ferrugineo-fusco; poris profundis (ad 1 c.m. longis) subhexagonis, intus glaucescentibus (1 m.m. diam.). *Hexagonia strigosa*, Cke. in Herb.

On trunks. Madagascar, Isle of Reunion.

HEXAGONIA. Fries.

We fail to discover any good reason why the stipitate species of *Hexagonia*, such as *H. gracilis*, were not worthy of a separate section, as in other genera.

Spegazzini has included in his "Fungi Guaranitica" (ii, p. 15) *Hexagonia versicolor*, Fries, which we do not discover in Saccardo, nor have we as yet found a species under that name described by Fries.

Favolus transiens (Cesati), in *Sacc. Syll.* No. 6483, is certainly not a *Favolus*, but *Hexagonia*, according to specimen from Cesati in Herb. Kew.

The following species do not appear to have been described hitherto, although for a long time known from specimens:—

Hexagonia lævis, Berk. in Herb.

Pileo carnososuberoso, orbiculato, aut reniformi (8 c.m. long) lævi, cervino, opaco, pruinoso, circa marginem depresso-zonato; alveolis profundis, magnis, irregulariter angulatis, subhexagonis (2-4 m.m. diam.) canescentibus, dissepimentis crassiusculis.

On trunks. Andaman Islands.

Hexagonia tenuis, Hook. *Sacc. Syll.* 6324.

var. **subtenuis**, Berk. in Herb.

This, which stands in Herb. Berk. as *Hexagonia subtenuis*, is hardly distinguishable from *H. tenuis*, except that the alveoli are doubly as broad ($1\frac{1}{2}$ -2 m.m.).

Central America, Australia, Mauritius, Nilgherries (India).

SOME OMITTED DIAGNOSES.

Agaricus (Inocybe) sabuletorum, Berk. & Curt. (No. 857).

Pileo carnosulo, convexo, applanato, tenui, sericeo, umbrino, (1 c.m. diam.), stipite gracili, aequali (2 c.m. long), concolori, glabro, lamellis lanceolatis, adnatis, vix confertis, umbrinis. Sporibus angulatis, $12\ \mu$ long. Cystidiis majusculis.

In sandy pine woods. Carolina (M.A.C.)

In Saccardo's Sylloge the following species require correction:—

Hebeloma psammium, *Sacc. Syll.* 3297, should be *Inocybe psammium*, Berk.

Hebeloma micropyramis, *Sacc. Syll.* 3269, should be *Inocybe micropyramis*, B & Br.

Hebeloma ignobilis, *Sacc. Syll.* 3313, should be *Inocybe ignobilis*, Berk.

Agaricus (Inocybe) holophlebius, *Berk. in Herb.*

Pileo carnosulo, campanulato, expanso, late umbonato (3-6 c.m. diam.), floccoso-fibrilloso, cervino; stipite pallido, farcto, cylindrico, æquali (6 c.m. long, 4 m.m. thick); lamellis latis, adnatis, vix confertis, postice attenuatis, argillaceis, demum umbrinis; sporis lævibus, ellipticis, $10 \times 6 \mu$.

On the ground. Masulipatam, India.

Marasmius ascophorus, *Peck.*, has been omitted, as far as we can discover, from Saccardo's Sylloge, without explanation.

Thelephora griseozonata, *Cke. Rev. Fun. Amer.*, No. 444.

Cæspitosa, mollis. Pileolis imbricatis, applanatis (1-2 in.) sericeo-strigosis, zonatis; zonis cervinis, griseisque alternantibus, margine subfimbriato, badio, in stipitem sublateralem porrectis; hymenio infero purpureo-badio, rugoso; sporis subglobosis, asperulis, fuscis, 7-8 μ diam.

Ad terram. S. Carolina.

NEW SUB-GENUS OF AGARICUS.

By M. C. COOKE.

Hitherto no instance has been recorded in the *Hyporrhodii* of the occurrence of species analogous to *Amanita* in the possession of a volva and ring. That deficiency has at length been supplied, in Australian specimens of the missing link, and we do not hesitate to adopt the same principle which has been adopted in *Leucospori*, and whilst recognizing *Volvaria* as the analogue of *Amanitopsis*, constitute *Metarraria* as the true analogue of *Amanita*. The specimens were accompanied by drawings, so that an opportunity may soon arrive for us to publish a coloured figure of this new addition to the subgenera of *Agaricini*. Whether it shall hold generic or subgeneric rank is a question which we do not care to discuss, and may be left to individual opinion.

SUB-GEN. METRARRIA.

Universal veil at first continuous, distinct from the cuticle of the pileus, forming a volva at the base. Ring manifest. Spores pink.

Analogous to *Amanita*.

Ag. (Metraria) insignis, C. & M.

Pileus convex, then flattened, and depressed in the centre (10 c.m. diam.), margin cream colour, disc darker and rufescent, smooth, viscid, shining when dry. Stem solid, then hollow, 10 c.m. long, $2\frac{1}{2}$ thick, equal, bulbous at the base, whitish, smooth, rather fibrous. Volva rather lax, ring dependent, membranaceous. Gills adnate, lanceolate, or attenuated in front, pink. Spores apiculate at the base, $10 \times 6 \mu$.

In woods. Lilydale, Victoria (Martin 561).

FAVOLUS AND LASCHIA.

By M. C. COOKE.

Favolus subgelatinosus, Berk. in Herb. 3152.

Pileo carnosomembranaceo, flabelliformi (3×2 c.m.), albido, glabro, lævi, ambitu sublobato, postice in stipitem brevem attenuato; alveolis stipatis, arcuatis, radiatis, acie denticulatis, sporis albis.

On trunks. (No locality.)

A true *Favolus*, without any suggestion of the reason for the application of the name *subgelatinosus*.

Laschia decurrens (Favolus decurrens, B. & C. in Herb.)

Pileo orbiculari, pallidi (1 c.m. lat.), ad marginem in stipitem equilongam producto; poris paucis, magnis, hexagonis; dissepimentis crassis, obtusis, in stipitem decurrentibus.

On wood. Venezuela.

Laschia viridula (Favolus viridulus, B. & C. in Herb.)

Stipitata. Pileo orbiculari (1 c.m. lat.), glabro, tenni, fuligineo; stipite centrali (1 c.m. et ultra long), concolori; poris angulosis, venis radiantibus, anastomosantibus efformantibus. Hymenio subcæruleo-viridi.

On wood. Venezuela.

Laschia flabellula (Favolus flabellulum, B. & C. in Herb.)

Ochraceo. Pileo membranaceo, spathulato vel flabelliformi, minuto (3-5 m.m. long), postice in stipitem brevem attenuato, glabro, lævi. Hymenio concolori, alveolos angulosos inæquale composito.

On wood. Venezuela.

Laschia lurida, Cesati in Mycet. Born.

Omitted from Saccardo Sylloge.

If it is possible to maintain *Glaeoporus* as a distinct genus, some species of *Polyporus*, with a soft, subgelatinous hymenium, should be transferred to it. In addition, Berkeley has an Indian species of which we find no diagnosis.

Glaeoporus corrugatus, Berk. in Herb. 3048.

Pileo conchiformi, carnosoleuto (1 unc. lat.), reticulato-rugoso, glabro, rufo-fusco, sicco corneo, obscuriore. Hymenio pallidiori; poris curtis, stipatis, rotundatis, minutis, ad marginem sterili, initio gelatinosis.

Ad truncos. Nilgherries, 1869.

OMITTED DISCOMYCETES.

By W. PHILLIPS, F.L.S.

Humaria stromella, *Cke. & Phil., n.s.* *Helotium stramellum*, *Cke. & Phil. in Herb. Kew.*

Gregarious, sessile or subsessile, plane, seated on a pale yellow membranaceous stroma; hymenium immarginate, sulphureous; exterior minutely granular, and darker in colour; asci cylindrical; sporidia 8, fusoido-elliptic, $15-19 \times 8-9 \mu$; paraphyses abundant, slenderly filiform, curved, and sometimes branched at the summit.

On dead moss, leaves, sticks, etc. Winton, New Zealand (124).

The cups are $\frac{1}{2}$ to 1 line broad; asci, $180 \times 10 \mu$. The thin stroma from which the cups arise led us at first to refer it to *Humaria carbonigena*, Berk.

Hymenoscypha Carmichaelii (*Berk.*), *Phil.*

Scattered or caespitose, stipitate, cup becoming plane, margin raised, entire; hymenium fuliginous; stem rather long, slender, brownish, tomentose at the very base; asci clavate; sporidia 8, fusiform or clavato-fusiform, guttate, $25 \times 5 \mu$, paraphyses slenderly filiform, numerous.

On decayed wood. Scotland (?). Capt. Carmichael.

Cups $\frac{1}{2}$ a line broad; rather more than a line high. Asci $90 \times 9 \mu$. How far the colour may have altered by the means employed to preserve the specimen it is difficult to judge; the dark hymenium and the brown stem give it a marked appearance. It is near *Hymenoscypha scutula* (Pers.).

Hymenoscypha flexipes, *Cke. & Phil.*

Scattered or caespitose, stipitate, cups at first pyriform, then infundibuliform, margin entire, inflexed, exterior granulose, pale alutaceous, hymenium darker; stem long, flexuous; asci narrowly clavate; sporidia 8, fusiform, $4-6 \times 1 \mu$, paraphyses slenderly filiform.

On decorticated wood. Kew Herbarium.

Cups $\frac{1}{4}$ to $\frac{3}{4}$ of a line broad; $\frac{1}{2}$ to 1 line high. Asci, 35×3 .

Helotium aurantiacum, *Cke.*

Sessile or subsessile, plane, hymenium orange yellow, margin thin, erect; asci cylindraco-clavate; sporidia 6 to 8, fusiform, straight or bent, 2-5-guttulate, becoming pseudo-septate, $14-18 \times 4-5 \mu$, paraphyses filiform, simple, abundant.

On the underside of decayed leaves. U.S. America. J. B. Ellis, No. 75.

The cups are 1 to 2 lines broad; asci, $80-100 \times 7-9 \mu$.

Mollisia chlorosticta, *E. P. Fries*.

Scattered or gregarious, minute, cupulate, sessile, glabrous, greenish-yellow, margin prominent, entire, here and there flexuous, of the same colour; asci clavate ($30-45 \times 6-8 \mu$), sporidia 8, oblong, $2-3 \times 1 \mu$; paraphyses slenderly filiform.

On the inside of fallen bark of *Ulmus montana*. Upsala, 1853, E. P. Fries (No. 7786). Also inside the bark of *Acer*. Upsala, L. Romell, 1885 (No. 14).

Lachnella luzulina, *Phil.*

Occurs in Saccardo's Syllogæ, p. 149, as *Dasyscypha hyalina* (Phill.), Sacc. Evidently an error of transcription.

Lachnella albopileata, *Cke.*

var. *subaurata*, *Ellis*.

On both sides of the leaves of *Clethra alnifolia*, J. B. Ellis, Newfield, N.J., U.S.

The sporidia in the type are $6-8 \times 1-5 \mu$; those of the variety $5-6 \times 1 \mu$; and the acerose paraphyses have generally two distinct septa in them, a character rarely occurring. There is another characteristic of this plant; in the place of the hairs secreting at their tips oxalate of lime, as in *Lachnella crucifera*, *L. echinulata*, and others, a golden yellow juice is secreted, which on drying leave a yellow shining globule at the tips of the hairs. These features may well justify its elevation to specific rank.

Lachnella conformis, *Cke.*

Scattered, minute, shortly stipitate or sessile, rather cupulate, becoming plane, clothed with short, colourless, obtuse hairs, hymenium pale fawn-colour; asci cylindraceo-clavate, sporidia 8, slenderly lanceolate, $10 \times 1 \mu$, paraphyses slender, acerose, exceeding the asci.

On *Juncus*. Darenth. July, 1875.

Although resembling *L. apala*, the much shorter sporidia at once distinguish it.

Encælia hypochlora, *Berk. & Curt.*

Scattered, sessile, capulate, firm, sub-coriaceous, greenish-yellow, furfuraceous; hymenium dull ochraceous, asci narrowly clavate; sporidia 8, fusiform or oblongo-fusiform, straight or bent, $10-12 \times 2-25 \mu$; paraphyses slenderly filiform.

On dead bark. Cuba.

Cups $\frac{1}{2}$ to 1 line broad; asci $60-65 \times 5-6 \mu$. This has lain in Berkeley's Herbarium undescribed for years. Why the illustrious M. Saccardo has ignored the genus *Encælia*, Fr., it is not easy to discover; his doing so has led him to throw into *Cenangium* many heterogeneous species.

MEMORABILIA.

THELEPHORA PEDICELLATA, Schw.—According to authentic specimens we are led to the conclusion that *Thelephora suffulta*, B. & Br., *Thelephora retiformis*, B. & C., and *Thelephora reticulata*, B. & C., are all merely forms of one and the same species known as *Thelephora pedicellata*, S.

BRITISH EDIBLE FUNGI.—A little volume under this title, by M. C. Cooke, with twelve coloured plates, including forty species, is now in the press, and will shortly be published at seven shillings and sixpence, by Messrs. Kegan Paul, Trench, Trubner and Co., of No. 1, Paternoster Square, E.C.

EMERICELLA VARIECOLOR, B. & Br.—On the portions of wood bearing the above fungus there is a copious development of *Inzengæa erythrospora*, Borzi, fully described and beautifully illustrated in Pringsheim's "Jahrbucher," 1885, p. 450, and again described as the type of a new genus called *Theclospora* by Harkness in "Californian Fungi," p. 21. The latter mistake was corrected in "Grevillea," 1888, p. 116; nevertheless, M. N. Patouillard, President of the Société Mycologique de France, has fallen into the error of mistaking the latter for the true *Emericella*, with which it is mixed. The author's description and figures in the "Bulletin de la Société Mycologique de France," Vol. VII., p. 45 (1891), refer entirely to *Inzengæa*. Nevertheless, the learned President has utilized this material to show that I was entirely mistaken in my ideas respecting the nature of *Emericella*.—G. M.

ADDITIONS TO MERULIUS.

By M. C. COOKE.

Merulius sordidus, Berk. & Curt.

Sordidus, resupinato-reflexus, submembranaceous, margine sublibero; subtus sericeus, pallescens. Hymenio sordide-fusco, reticulato-poroso, plicis sinuibus, sicco vix conspicuis, sporis $7 \times 5 \mu$, dilute fuscis.

On wood. Venezuela.

Merulius rimosus, Berk. in Herb.

Effusus, tenuis, mollis (circa 1 unc. lat.), adnatus, margine libero, reflexo, subalutaceo; hymenio saturatiore, rimoso-diffracto, demum areolato-frustuloso, plicis tenuibus, gyrosis. Sporis minutis ($3 \times 2 \mu$?).

On alder. New York, U.S. (Ellis, 586).

Merulius pelliculosus, Cooke.

Broadly effused, membranaceous, closely adnate, white, hyaline when dry, like a thin pellicle, margin naked, hymenium reticulated with shallow angular pores, scarcely visible when dry (about $\frac{1}{2}$ m.m. diam.).

On branches of *Acacia*. Victoria. (Mrs. Martin, 762).

Merulius pallens, Schwein (not of Berkeley).

Does not appear to differ from *Merulius corium*.

Merulius terrestris, B. & Br. (undescribed).

Can scarcely be different from *Merulius brassicæfolius*. Schwein.

IRPEX ADDENDA.

By M. C. COOKE.

Irpex decurrens, Berk. in Herb.

Pileo effuso, reflexo, tenui, azono (1-2 c.m.), sericeo, fuligineo, sicco incurvo, postice decurrente; dentibus subulatis, acutis, elongatis, pallidioribus.

On bark. Japan. (Dickins, 16.)

Irpex crispatus, Berk. in Herb.

Totus resupinatus, ex albo ochraceus, subiculo tenui, subarachnoideo, aculeis compressis, membranaceis, inæqualibus, crispatis, apice denticulatis.

On bark. Venezuela.

Quite different from *I. depauperatus*.

Irpex modestus, Berk. in Herb.

Effusus, adnatus, umbrinus; margine indeterminato, tennissimo, subvelutino, sinuato-poroso; dentibus confertis, compressis, breviusculis, basi conjunctis.

On bark. Mauritius.

More delicate than any form of *I. cinnamomeus*.

Berkeley includes *Polyporus candidulus*, Lev. Sacc. Syll., No. 5151, under *Irpex* with specimens from France, but we are disposed to doubt its being a good *Irpex*.

Irpex clathratus, Berk. in Herb.

On bark from Venezuela.

Appears to be too abnormal a condition for description as a distinct species.

Irpex decolorans (*Irpex decolor*, B. & C. in Herb.).

Incrustans, mollis, subgelatinosus, albus, demum cartilagineus lividusque; ambitu determinato, subfimbriato; dentibus compressis, inæqualibus, sparsis; apice acutis, integris.

On rotten logs, over-running leaves, twigs, etc. Cuba, 835.

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Grevillea,

A QUARTERLY RECORD OF
CRYPTOGAMIC BOTANY
AND ITS LITERATURE.

EDITED BY M. C. COOKE, M.A., A.L.S.,

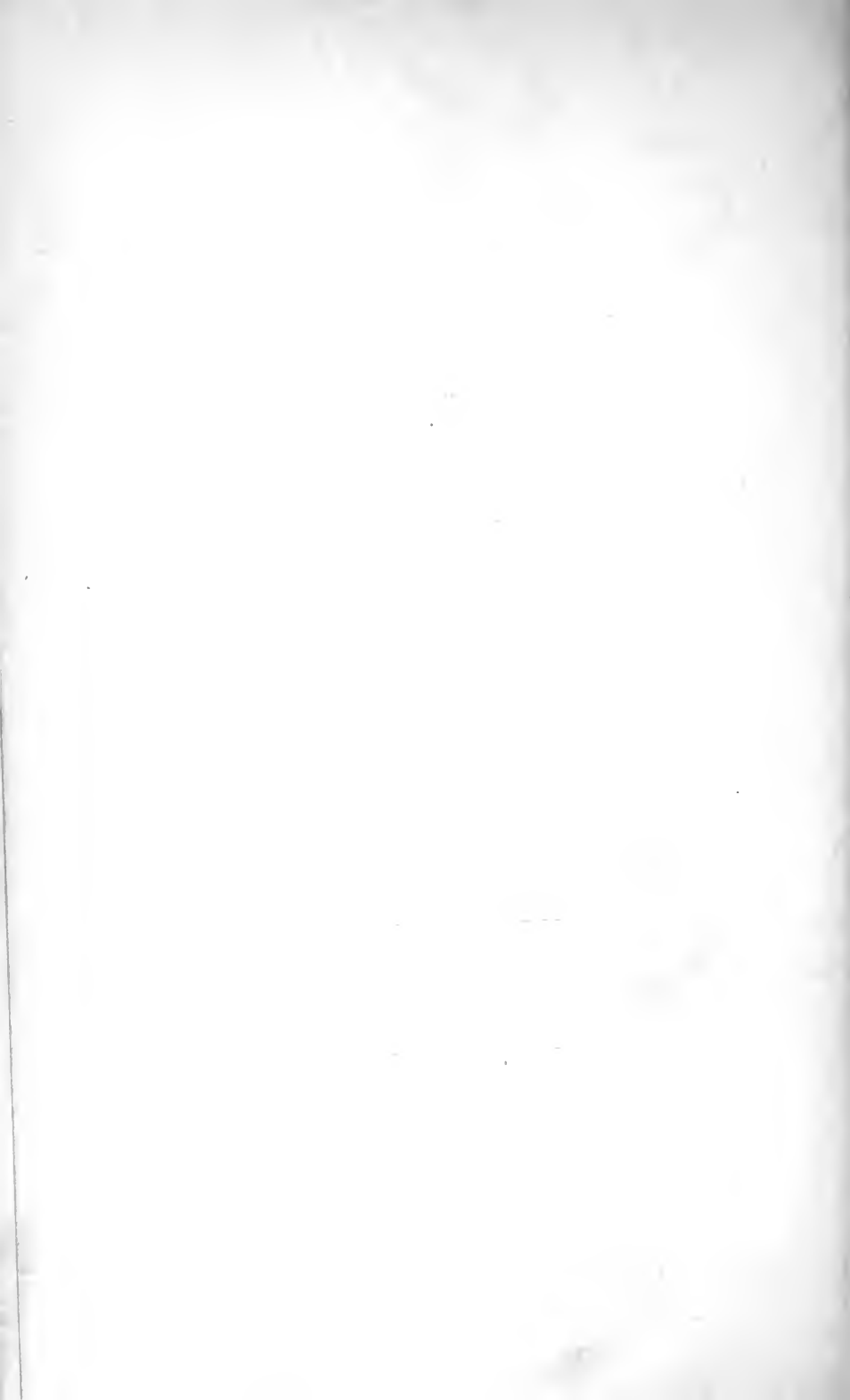
*Author of "Handbook of British Fungi," "Illustrations of British
Fungi," "Fungi, their uses," &c., "Rust, Smut, Mildew,
and Mould," "British Fresh Water Algae,"
"British Desmids," &c., &c.*

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PREFACE.

TWENTY years since, with some anxiety and no little hope, I commenced this Journal, wholly on my own pecuniary responsibility, and as the sole director of its destinies. At that time I felt strong in the co-operation of my old friends, the Rev. M. J. Berkeley, the Rev. C. Kalchbrenner, and the Rev. W. A. Leighton, all of whom have since gone over to "join the great majority." After this long interval I have considered it advisable to transfer the duties and responsibilities to other and younger hands, but without severing my interest, or withholding from it the use of my pen. It is with feelings of pleasure and confidence that I resign the editorial chair to my friend and colleague, Mr. George Massee, and I feel sure that my subscribers will see in this an earnest of no decadence in interest or value, and a sufficient cause for appealing to them for continued and increasing support. It is unnecessary to offer further reasons or apology for the course which I have thought fit to take than have already been offered. I might urge that after being twenty years under the control of one individual, a change would probably be an advantage to any journal, especially when the antecedents of the new director give such good promise. As I bid farewell to my official connection, it is with a feeling of pride and satisfaction that I acknowledge the success of my venture, in one essential point, in which failure is not uncommon, that there has always been a small balance of receipts over expenditure. It has not been a "valuable literary property" in the business acceptance of that phrase, but it is some consolation that a scientific journal could be conducted for twenty years without pecuniary loss, although I have never taken the best advantage of the facilities it afforded for lack of leisure to devote myself to the proprietary interest as well as the editorial.

I desire to claim no especial merit for the work I have done or attempted, but will rest content to leave that to be appraised by those who have benefited by it. Still, I should not be willing to make my bow and retire without an expression of thanks to all those who have assisted me, without fee or reward, in filling up these pages from year to year. It would be invidious to name some and exclude others, so that I will simply refer to the names of such writers as appear in each annual index as indication of the persons to whom my thanks are tendered.

I have been assured that it is not intended to make any material alteration in this Journal, either in form or contents, and the sequence will remain unbroken. For my successor I have only to solicit the same forbearance as I have received, and an increased, and ever increasing, measure of generous support, with which I take my leave.

M. C. COOKE.

Grevillea.

A QUARTERLY RECORD OF CRYPTOGAMIC BOTANY
AND ITS LITERATURE.

SPECIES OF HYDNEI.

ADDITAMENTA TO SACCARDO'S SYLLOGE.

Hydnum peroxydatum, Berk.

Crassum, effusum, arcte adnatum, ferrugineum vel peroxydatum; aculeis obliquis, pendulis, stalactiformibus, crassiusculis, subconfertis, ad basim connatis, rectis, longiusculis (2 m.m.) obtusis.

On trunks. Venezuela, 134.

Hydnum analogum, Berk. in Herb.

Subiculo effuso, subvillosa, sulphureo. Aculeis sparsis, paucis, cylindraceis, gracilis, pulverulentibus (1-9 m.m. long), flavidis.

On rotten wood. Neilgherries, India.

Hydnum Lixiodendri, B. & C. in Herb.

Does not appear to differ specifically from *Hydnum Halei*.

Hydnum artocreas, Berk. & Curt. in Herb.

Coriaceum, effusum, margine elevato, limitato, purpureo-fusco, sublibero, canaliculato; aculeis ochroleucis, prælongis, deorsum in areolas connatis, sursum obtusis, totis farinaceis.

On trunks. Venezuela, 139.

A most distinct and characteristic species, five or six inches long.

Hydnum cohærens, Berk. & Curt.

Niveum, subiculo membranaceo, chartaceo, tenui, adnato, ambitu flocculoso. Aculeis subulatis, gracilibus, acutis, hinc illic in plagas transversos confertis, ceteris nudis.

On bark. Venezuela, 133.

Hydnum scariosum, B. & Br.

Resupinatum, membranaceum, cervinum, sæpe confluens (1-10 c.m. long), margine libero, sterili. Aculeis brevibus, minutissimis, gracilis, acutis, conspersis, concoloribus.

On bark. Ceylon, No. 162.

Apparently the description was inadvertently omitted from the "Fungi of Ceylon."

Hydnum microdon, Pers. *Fr. Syst. Myc.* i. 147. *Klot. H.C. Myc.* 1918, *ed nova* 133.

Omitted from Saccardo Sylloge.

Hydnum luteo-virens, Cesati.

From Pedrotallagalla.

Appears to be an *Irpe*x.

Hydnum Berkeleyi, Curtis. (*Ravenel* 963).

We fail to trace description.

Hydnum albiceps, B. & Rav. *Herb. Berk.*

As far as the United States specimens are concerned, this does not appear to be distinct from *H. membranaceum*. The Ceylon specimen seems quite different.

Hydnum herbicolum, Ellis MSS.

On stems of *Phytolacca*. (No. 3865.)

Is this described?

Hydnum trechodontium, Berk. in *Herb. Rav. Fun. Car.* iii. 20.

On oak logs. *Ravenel*, 1296.

Doubtless a form of *H. mucidum*.

Hydnum (Resup.) lachnodontium, Berk.

Albidum. Subiculo latissimo, papyraceo, primum flocculoso, niveo, margine villosa; aculeis prælongis, acicularibus, plerumque ad basim compressis, flaccidis, inæqualibus, acutis (2-3 m.m. longis).

On logs, etc. Neilgherries, India.

Hydnum Ayresii, Berk. in *Herb.*

Subiculo crustaceo, tenui, effuso, umbrino, margine indeterminato, velutino, pallescente. Aculeis confertissimis, subulatis, brevibus, acutis, sæpe deorsum compressis, vel confluentibus.

On bark. Mauritius.

There is another species from Venezuela in *Herb. Berk.* under the name of *Hydnum uncinatum*, but the specimens are small and may be immature, or, at least, are hardly satisfactory for description.

RADULUM.

Of the species of *Radulum* not included in Saccardo Sylloge may be mentioned:

Radulum spongiosum, Berk. *Hook. Journ.* 1854, p. 168.

Eastern Nepal.

Radulum thelephoroides, Berk. in *Herb.*

= *Thelephora hydnoidea*, Schwein.

Radulum pini-canadensis, Schwein. *Fungi Amer.-Boreali* No. 595.

Radulum hydnans, Schwein. *Fungi Amer.-Boreali* No. 596.

Radulum investiens, Schwein. *Fungi Amer.-Boreali* No. 597.

Radulum taurinense, *de Notaris in Herb. Berk.*

This is an authentic specimen from Notaris, but where described is unknown to us.

Radulum Emerici, *Berk.*

Resupinatum, adnatum, suborbiculare vel confluens, alutaceum, margine albedo. Hymenio initio poroso, demum dentato, dissepimentis tenuibus, acutis.

On logs. Neilgherries, India.

Radulum Neilgherrensis, *Berk. in Herb.*

Primum velutinum, demum subglabrescens. Hymenio pallide violaceo-cervino, margine sterili, tomentoso; dentibus brevibus, obtusis.

On logs. Neilgherries, India.

PHLEBIA, *Fries.***Phlebia spilomea**, *Berk. & Curt.*

Effusa, orbicularis vel confluens, adnata, membranacea, ambitu pallido, byssino, hymenio purpureo, plicis radiantibus, minimis, demum papillatis.

On bark. Venezuela, S. Carolina, Iowa.

Phlebia deglubens, *Berk. & Curt.*

Effusa, adnata, ambitu libero, recurvo, subtus pallido; hymenio rufescente, plicis intricatis, meruliæformibus, dein subpapillatis, ceraceis.

On trunks. Venezuela.

Phlebia arachnoidea, *B. & C. (Venezuela).*

The specimens are too uncertain for description.

To the above must be added also:

Phlebia coccineo-fulva, *Schwein. Fungi Amer. Bor., p. 165, No. 603.***Phlebia hydnoidea**, *Schwein. Fungi Amer. Bor., p. 165, No. 604.*

The latter has been referred to *Odontia lateritia*, B. & C., which may be correct as far as the single authentic specimen is concerned.

Odontia albominiata, *B. & C.*, which seems to be also *Hydnum cinnabarinum*, *Schwein.*, has been referred to *Odontia lateritia*, B. & C., but this we conceive to be an error.

Odontia scopinella, *Berk. Sacc. Syll. 6825*, is not a *Hydnum*, as described, but *Odontia*, to which genus Berkeley afterwards transferred it in his herbarium.

Kneiffia tinctor, *Berk. in Herb.*

Tota resupinata, tenuis, effusa, læte alutacea, subtus matricis rufo-tincta, margine indeterminato, granulis minutis.

On rotten wood. Venezuela, 151.

Kneiffia subtilis, Berk. in Herb.

Tennis, effusa, membranacea, mycelio niveo, arachnoideo enata, tota albida, margine indeterminato, granulis minutis, hinc illic aggregatis.

On wood and branches. Venezuela, 155, 156, 157. New Zealand, 160.

Kneiffia typhæ, Berk. in Herb.

This is *Corticium typhæ* forma *hydnoidea*.

AUSTRALIAN FUNGI.

By M. C. COOKE.

(Continued from Vol. XIX., p. 92.)

Strobilomyces ligulatus, Cooke.

Pileus convex, hemispherical (10 c.m. diam.), brown, clad with darker ligulate scales, composed of parallel threads (7-8 m.m. long), often recurved at the extremity. Stem (12 c.m. long, 2 c.m. thick) striate, with a few scattered fibrils, paler, rather attenuated upwards. Tubes long, shortened behind, angular, yellowish, or with a reddish tint. Spores brown, elliptical, $20 \times 10 \mu$.

On the ground. Victoria. (Martin, 832.)

Strobilomyces fasciculatus, Cooke.

Pileus hemispherical, convex, reddish-brown (8-10 c.m. diam.), squamulose, the fascicles of strap-like scales parting into large pentagonal areolæ. Stem nearly equal (8-10 c.m. long, $1\frac{1}{2}$ c.m. thick), even, paler. Tubes elongated, free behind, mouths angular, yellowish. Spores elliptical, pale brown, $10-12 \times 5 \mu$, flesh turning bluish when cut.

On the ground. Victoria. (Martin, 777.)

Hypocrella axillaris, Cooke.

Stroma obturbinate or obclavate, seated in the upper axils (5 m.m. long, 2-3 broad), black, opaque, minutely granular with the ostiola; substance white. Perithecia very minute, immersed in the periphery. Asci cylindrical, 120μ long. Sporidia filiform, at length multiseptate (about 100μ long), hyaline.

On grasses. Brisbane. (F. M. Bailey, 897, 898.)

Somewhat resembling *H. bambusæ*, but larger and less globose. Size and form not unlike *H. strangulans*, Mont. Upon more mature consideration both these appear to have greater relationship with *Hypocrella* than with *Epichloë*.

Phyllachora maculata, Cooke.

Stroma gregarious on bullate tawny spots of the living leaves ($1\frac{1}{2}$ -1 c.m. broad), black, semi-immersed. Asci clavate. Sporidia elongated, elliptical, a little narrowed to each end, hyaline, $22-25 \times 8 \mu$.

On leaves of *Eucalyptus*. Victoria. (Mrs. Martin, No. 9.)

Dothidella inæqualis, Cooke.

Stroma erumpent, then subsuperficial, on both surfaces, nearly orbicular (about 2 m.m. diam.), black, shining, with three to five elevations corresponding to the cells. Asci clavate, octosporous. Sporidia cylindrically elliptical, with one septum about one-fourth the length, dividing the sporidium into two unequal cells, one of which three times the length of the other ($20-24 \times 6 \mu$), pale amber colour.

On dead leaves of *Eucalyptus*. Victoria. (Martin, 824.)

Some cavities contain stylospores which are elongated, fusiform, curved, acute at both ends, 3-5 septate ($50-55 \times 3 \mu$), hyaline.

Montagnella rugulosa, Cooke.

Epiphylla vel hypophylla. Stromata tenui suborbiculari (1 m.m. diam.), atro, depresso, rugoso, loculis polyascis. Asci clavatis. Sporidiis lanceolatis, triseptatis, dilute olivaceis, $20 \times 6 \mu$.

On leaves of *Eucalyptus*. Victoria. (Mrs. Martin, 705, 745.)

Physalospora microsticta, Cooke.

Perithecia scattered, on both surfaces, innate, punctiform, globose, black with a papillate ostiolum. Asci cylindrical. Sporidia uniseriate, elliptical or almond shaped, continuous, hyaline, $14-16 \times 8 \mu$.

On dead phyllodes (?). Victoria. (Mrs. Martin.)

Trabutia parvicapsa, Cooke.

Innate; perithecia on brown elliptical spots, on both surfaces, convex, rather crowded, small, black, somewhat shining, numerous. Asci clavate, tetrasporous or octosporous. Sporidia lanceolate, rounded at the ends, continuous, granular within, hyaline, $35-40 \times 10 \mu$. Whole contents of the perithecia with a pink tinge.

On phyllodes of *Acacia*. Victoria. (Mrs. Martin, 774.)

Besides the difference in the sporidia, this differs from *T. phyllodiarum* in the much smaller and more numerous perithecia.

Anthostomella Lepidospermæ, Cooke.

Perithecia seated on bleached elongated spots which have a dark brown border, globulose, at first covered, then splitting the cuticle. Asci shortly stipitate. Sporidia elongated-elliptical, biseriate, rounded at the ends, continuous, clear brown ($14 \times 4 \mu$).

On *Lepidosperma*. Victoria. (Mrs. Martin, 781.)

Sphærella cryptica, Cooke.

On both surfaces of the leaves. Spots reddish-brown, large, irregular or confluent. Perithecia subglobose, immersed in the substance of the leaf, with scarcely any indication of their presence. Asci obpyriform or obclavate, sessile. Sporidia lanceolate, uniseptate, not constricted, hyaline, $10 \times 3 \mu$.

On fading leaves of *Eucalyptus*. Victoria. (Mrs. Martin, 753.)

Dimerosporium parvulum, Cooke.

Perithecia minute, subglobose, membranaceous, with a brown sparse radiating mycelium, seated on irregular black spots (in

company with *Asteromella*). Asci globose, with a small basal apiculus. Sporidia elliptical, uniseptate, constricted at the septum, hyaline, $11-20 \times 8 \mu$ (possibly acquiring colour when mature).

On living leaves of *Trema aspera*. Zandina, Queensland. (Bailey, 902.)

***Asteromella epitrema*, Cooke.**

Spots on the upper surface, black, somewhat orbicular or confluent, bearing a mycelium of brown jointed threads. Perithecia minute, subglobose, membranaceous, seated on the mycelium. Sporules numerous, somewhat fusiform, or narrowly elliptical, continuous, guttulate, hyaline, $10-12 \times 3 \mu$.

On living leaves of *Trema aspera*. Zandina, Queensland. (Bailey, 902.)

In company with *Dimerosporium parvulum*.

***Piggotia substellata*, Cooke.**

On the under surface, forming small somewhat orbicular stellate black patches (1-2 m.m. diam.), composed of the confluent, flattened perithecia, which are sometimes distinct, seated on rather larger tawny spots. Sporules cylindrical, straight, obtuse at the ends ($8 \times 1 \mu$), hyaline, on longer simple basidia.

On leaves of *Eucalyptus*. Victoria. (Mrs. Martin, 744.)

***Leptothyrium aristatum*, Cooke.**

Perithecia scattered, superficial, scutate, orbicular, submembranaceous, radiately cellular, dark brown ($\frac{1}{10}$ m.m.). Sporules cylindrical, strongly curved, obtuse at the ends, with an oblique hyaline bristle at one end, equal in length to the sporule, hyaline, $14-15 \times 2-3 \mu$.

On dead leaves of *Eucalyptus*. Victoria. (Mrs. Martin, 752.)

***Stagonospora orbicularis*, Cooke.**

Forming small orbicular pallid spots (5 m.m. diam.) on either surface, circumscribed by a brown line. Perithecia few (3 to 5) in the centre of the spots, covered by the cuticle, which is at length cracked, globose depressed, black. Sporules fusiform, acute at the ends, curved, 3-5 septate, constricted at the septa, hyaline, $60-70 \times 8 \mu$.

On dead leaves of *Eucalyptus*. Victoria. (Mrs. Martin, 740, 768.)

***Stilbospora foliorum*, Cooke.**

Epiphyllous. Pustules on orbicular paler spots, splitting the cuticle, with three or four orifices, through which the sporules escape. Stroma flattened, conidia broadly elliptical, a little narrowed towards each extremity, three septate, not constricted, olive brown, becoming nearly opaque ($22 \times 8-9 \mu$).

On dead leaves of *Eucalyptus*. Victoria. (Mrs. Martin, 132.)

***Strumella patelloidea*, Cke. & Mass.**

Stroma orbicular, patelloid, scattered, superficial, black ($1-1\frac{1}{2}$ m.m. diam.), conidia subglobose or ovate, continuous, dark olive ($7-8 \mu$ diam.), on short sporophores.

On naked wood. Tasmania. (Martin, 789.)

Similar in fruit to *S. hysterioidea*, but quite different in habit and appearance.

BREFELD'S "MYKOLOGIE."*

Mycological works, in German, have a most limited circulation in this country, and our Tenton friends are very much mistaken if they think that any amount of effort on their part will materially increase it. Some expressions of disappointment have reached us that German works, many of them excellent, meet with so limited a sale, and such small encouragement in Britain. It should not be forgotten that mycologists are very limited in number in these islands, and some of these are unable to purchase indiscriminately expensive works in any language, whilst the number capable of perusing German with ease is considerably less. All those capable of reading and appreciating Dr. Brefeld's works, for instance, could be counted on the fingers of one hand. Up to the present nine parts have been issued, and the combined cost is £9 7s., and a tenth part is announced at twenty-six shillings. Alas, the purchasers, at ten guineas, of German Mycological works, with analytical figures, however beautifully executed, would scarcely be flattering, if a census could be ascertained.

We may add a brief summary of the general contents of the nine parts.

Part I. contains *Mucor mucedo*, *Chaetocladium Jonesii*, and *Piptocephalis Frieseniana*, with remarks on the Zygomycetes.

Part II. is in illustration of *Penicillium*.

Part III. contains the first part of the Basidiomycetes, with observations on *Coprinus stercorearius*, *C. lagopus*, *C. ephemerus*, *C. ephemeroideis*, *Amanita muscaria*, *Agaricus melleus*, and generally on Gasteromycetes, Clavariæ, and Tremellini.

Part IV. Methods of culture.

Part V. is devoted to the Ustilagineæ.

Part VI. includes Myxomycetes and the Entomophthoræ.

Part VII. The second portion of the Basidiomycetes, principally the Tremellini.

Part VIII. The third portion of the Basidiomycetes.

Part IX. on Exoascus, and the first part of the Ascomycetes.

* "Untersuchungen aus dem Gesamtgebiete der Mykologie." Von Dr. Oscar Brefeld. Heft. ix. Die Hemiasci und die Ascomyceten. Munster, 1891.

Part X., when issued, will contain a continuation of the Ascomycetes.

The entire ten parts will contain 90 quarto lithographic plates, including many hundreds of figures, and certainly very finely executed, but not comprehensible without the text, and therefore appealing only to the student, educated well up to the point. Taking the last part issued as an example, we cannot say that we think 60 pages of German and 4 plates, for sixteen shillings, offers any special inducement in an age of cheap books. If it should be argued that there existed no intention of producing a cheap book, but an indispensable one, which from its originality would command a sale at any cost, then it may be retorted, we think, that there are no specialists in this country, to whom the work is indispensable, who have not already obtained it, but, if there should be one or two still destitute, all the parts can be obtained through the ordinary channels of trade.

NEW BRITISH FUNGI.

By M. C. COOKE.

(Continued from Vol. XIX., p. 86.)

Kalmusia stromatica, Uke. & Mass.

Stroma eutypoid, effused, elevated, black, perithecia immersed, with distinct prominent ostiola, asci clavately cylindrical. Sporidia elongated, fusiform, 4 to 7 septate, not constricted, brown, $30 \times 6 \mu$.

On decorticated branches, near Oxford. (Baxter.)

Resembling somewhat *Kalmusia eutypoides*, but sporidia different.

Coryneum camelliae, Massee.

Epiphyllous, on irregular large bleached spots, limited by a dark margin. Pastules gregarious on the spots, splitting the cuticle in a linear, triangular, or irregular manner. Sporules lanceolate, ($30 \times 10 \mu$), with two to four coloured median cells, and a hyaline triangular apical and basal cell, seated on sporophores of about equal length.

On living *Camellia* leaves. Kew.

It is possible that this is only *Pestalozzia Guelpini* with the terminal awns suppressed, but technically it is a *Coryneum* in the present condition.

Ramularia petuniae, Cooke.

Epiphyllous. Spots large, orbicular or irregular, ochraceous. Conidia cylindrical, rounded at the ends, continuous, then uniseptate, hyaline ($20-22 \times 4 \mu$), on short basidia, sometimes covering the entire leaf, and destructive.

On leaves of *Petunia*. Plymouth.

SPECIES OF CYPHELLA.

BY M. C. COOKE.

To the species of *Cyphella* must be added the following, not included by Saccardo :—

Cyphella venustula (*Desm.*), *Peziza venustula*, *Desm. Ann. Sci. Nat. Ser. II. Pl. Crypt.* 1058. *Sacc. Syll.* VIII., 1770.

On *Acer negundo*.

Cyphella syringæ (*Wallr.*), *Peziza syringæ*, *Wallr. Rabh. F. E.* 32. *Sacc. Syll.* VIII., 1768. *Peziza velutina*, *Desm. Pl. Crypt.* No. 17.

On *Syringa*, etc.

Cyphella Tiliæ (*Peck*), *Peziza tiliæ*, *Peck. Sacc. Syll.* VIII., 1771.

On *Tilia*.

Cyphella inconspicua (*B. & C.*), *Peziza inconspicua*, *B. & C. Sacc. Syll.* VIII., 1788.

Sporules elliptic, $8 \times 5 \mu$.

Cyphella fumosa, *Cooke*.

Gregaria, stipitata, fumosa et nigrescens. Cupula ($1-1\frac{1}{2}$ m.m. diam.) membranacea, cyathiformia, flexuosa, deorsum in stipitem brevem attenuata, extus intusque lævi; sporis subglobosis (4μ diam.).

On rotting leaves of *Gladiolus*. S. Carolina (*Ravenel*, 3071.)

Cyphella virgultorum, *Cke. & Rav.*

On vine twigs, Okra, etc.

Cannot well be distinguished from *C. capula*.

Cyphella discoidea, *Cooke in Grev.*

Omitted from Saccardo Sylloge. New Zealand.

Cyphella fuscospora, *Currey in Herb.*

Sparsa, sessilis, minuta ($\frac{1}{4}-\frac{1}{5}$ m.m.) extus alba, tomentosa, intus flavescens, margine connivente. Sporulis fuscis, subglobosis vel subellipticis, punctulatis vel granulato-echinulatis (8-10 μ long).

On bark. Weybridge.

Cyphella Australiensis, *Cooke*.

Gregarious, cup-shaped, sessile ($1-1\frac{1}{2}$ m.m. diam.), pallid, clad with closely pressed silky hairs; margin connivent, disc honey coloured. Sporules $4-5 \times 3 \mu$.

On bark. Melbourne (*Berggren*, 378.)

Cyphella texensis, *Berk. & Curt. in Herb.*

Cupulata, sessilis, pallida ($1-1\frac{1}{2}$ m.m.), demum applanata, discoidea; extus pilis subrugosis ornata. Sporis ellipticis, majusculis.

On *Quercus*. Texas (*Wright*, 3779.)

Cyphella fissilis (*Fr.*), *Berk. in Herb.* *Cantharellus fissilis*, *Fr. Syst. Myc.* I., 324.

On the authority of Rev. M. J. Berkeley this is a *Cyphella*, distinct from *C. lacera*.

Cyphella arborum, *Fries*.

There is a specimen from Leveille under this name in Herb. Kew, but we know not where he has described any species under that name.

NOTES ON CLAVARIEI.

By M. C. COOKE.

Clavaria (Holocoryne) Muelleri, Berk.

Simple, clavate, white, slender (2-3 c.m. long), attenuated below into a thin cylindrical stem, apex obtuse.

On the ground. Victoria, Queensland.

Clavaria tuberosa, Sow. t. 199. Berk. & Br. Ann. Nat. Hist. No. 1448. *Calocera tuberosa*, Sacc. Syll.

This was determined by Berkeley to be a *Clavaria*, allied to *C. ardenia*. Spores 10 μ long.

Clavaria Tasmanica, Berk. in Herb.

Clubs simple, clavate (4 c.m. long), single, or two or three together, fuliginous, base expanded in a white floccose mycelium. Stem slender, paler, somewhat flexuous; spores sub-globose, 8 μ diam.

On tree ferns, wood, etc. Tasmania.

Calocera divaricata, Berk. Hook. Journ. 1842, p. 140, with fig. Possibly *Pterula divaricata*, Lev. Sacc. Syll. vi., 643.**Calocera rubra**, Berk. & Cooke. Fungi Brazil, 344. *Clavaria*, Sacc. Syll. 8113.

Always intended to have been described as a *Calocera*, but by contraction of the generic name to an initial, it has been mistaken for *Clavaria*.

Calocera merismatoides, Schwein. *Pterula*, Sacc. Syll. No. 7203.

We have already expressed an opinion as to the insertion of *Lachnocladium* in this family instead of *Thelephorei*, in which latter Berkeley always placed it.

Berkeley adds to this genus:—

Lachnocladium flagelliforme, Berk. *Clavaria flagelliformis*, Berk. Sacc. Syll. 8010.**Lachnocladium dilatatum** (Mont.), Berk. *Clavaria dilatata*, Mont. Sacc. Syll. 8150.**Lachnocladium delicia**, Berk. *Clavaria delicia*, Berk. Sacc. Syll. 8014.**Lachnocladium dealbatum**, Berk. *Clavaria dealbata*, Berk. Sacc. Syll. 7998.

We take this opportunity of repudiating the insinuation that we are animated by any personal feeling, or ambition, in our notes or suggestions for the rectification of Saccardo's Sylloge. Our sole desire has been that in a future supplement to that work additions and corrections might be made with a view to its greater perfection and utility.

Lachnocladium Kurzii, *Berk. in Herb.*

Nigrescens (3 c.m. alt.) erectum, dense cæspitosum, ramosissimum, gracile, rigidum; ramulis cylindraceis, ultimis tenuibus, subobtusis, compressis.

Ad terram. Java (*Kurz.* 558).

Lachnocladium rubiginosum, *Berk. & Curt. in Herb.*

Rubiginosum, breviter stipitatum (8 c.m. alt.), ramosissimum, cylindraceum, dense velutinum; ramis repetito-dichotomis, ramulis ultimis subulatis acutis.

On trunks (?). Venezuela 218.

The pubescence is caused by rigid brown setæ, like those of *Hymenochæte*.

Lachnocladium Hookeri, *Berk. Sacc. Syll.* 8176.

There is no such species; Berkeley afterwards stated (*Fungi Ceylon*, No. 673) that the specimens described under this name were *Clavaria formosa*, P.

Acutis gigantea (*Schw.*), *Sacc. Syll.* 7928.

This is evidently spurious, both as to genus and species. Berkeley demonstrated in *Gardener's Chronicle*, March 18, 1878, that the *Clavaria gigantea* of Schweinitz was only a malformation of *Lentinus tigrinus*, Fr.

NOTES ON THELEPHOREÆ.

By M. C. COOKE.

Hymenochæte episphæria (*Schw.*). *Thelephora episphæria*, *Schwein. Amer. Bor. No.* 723.

Spores olive, elliptical, $8 \times 5 \mu$. Setæ smooth, slender, brown.

Hymenochæte Kunzei (*Fr.*), *Mass. Mon. p.* 100. *Stereum Kunzei*, *Fries.*

British Guiana, Venezuela, Brazil.

Hymenochæte barbata, *Mass. Mon. p.* 109.
Ceylon.**Hymenochæte Kalchbrenneri**, *Mass. Mon. p.* 116.
New Zealand, Australia.**Hymenochæte nigrescens**, *Cooke, Mass. Mon. p.* 104.
Carlisle, G.B.**Hymenochæte pallida**, *Cke. & Mass. in Mass. Mon. p.* 97.
Mexico.**Hymenochæte scruposa**, *Mass. in Herb. Berk.*

Effused, rugose, scrupose, tawny umber, margin flexuous, becoming free and floccose, paler. Cystidia numerous, $80-90 \times 15 \mu$, bright brown. Spores, $7 \times 4 \mu$.

On bark. Venezuela.

✕

Hymenochæta tuberculosa, *Cooke Grev.* ix., 101. *Mass. Mon.* p. 112.
Brazil. Glazion, 12332.

Hymenochæta tasmanica, *Mass. Mon.* p. 105. *St. rubiginosum*, *Berk.*
Tasmania.

Peniophora lilacina (*Schw.*), *Mass. Mon.* p. 147. *Thelephora lilacina*,
Schw. Amer. Bor. No. 680.

Peniophora occidentalis, *E. & E. in Ellis N.A. Fungi* No. 2314.

Corticium apalum, *B. & Br. Journ. Linn. Soc.* xiv., 72. *Asterostroma*
apala, *Mass. Mon.*

Corticium Berkeleyi, *Cooke, Rav. Fung. Amer.* 225. *Ellis N.A.F.*
934. *Massee Mon.* p. 133.

On pine logs. U.S.

Corticium compactum, *B. & Curt. in Herb.*

Broadly effused, indeterminate, ochraceous white, tuberculate,
rigid. Hymenium smooth.

On bark. Pennsylvania, No. 6025.

Corticium carbonaceum, *B. & Curt. in Herb.*

Wholly effused, thin, papyraceous, becoming black. Hymenium
smooth. Spores elliptical, $5 \times 3 \mu$.

On bark. Venezuela, No. 286.

Corticium debile, *B. & C. Mass. Mon.* p. 131.

On wood. Venezuela.

Corticium ceraceum, *B. & Rav. in Rav. Fungi Amer.* 453. *Rav. Car.*
Exs. III. 29. *Cort. molle*, *B. & C. Ellis N.A.F.* 607. *Cort. armenia-*
cum, *Sacc. Syll.* 7665.

Corticium Lycii (*Pers.*), *Grev.* ix., 95. *Massee Mon.* p. 122.

Europe.

Corticium lacunosum, *B. & Br. Ann. Nat. Hist. Fr. Hym. Eur.* 661.
Aboyne.

Corticium penetrans, *C. & M. Grev.* xix., p. 90.

Victoria.

Corticium radicale, *Hook. Journ.* 1845, p. 59.

Australia.

Corticium rubi (*Lib.*). *Thelephora Rubi*, *Lib. Pl. Cry. Ard.* 323.

Corticium rubicola, *Berk.*

Pennsylvania. = *C. ambiens*, *B. & Br.*

Corticium rigescens, *B. & Curt. in Herb.*

Broadly effused, closely adnate, rigid, white, cracking or be-
coming porose when dry, here and there, especially at the margin,
turning brownish by exposure of the darker substratum.

On wood, etc. Venezuela, 186, 187, 118, 191.

Corticium elevatum, *B. & C.*

Pennsylvania.

Stratose, no hymenium. Probably a morbid *Poria*.

Corticium fœtidum, B. & Br. *Ann. Nat. Hist.* 1879. *Massee Mon.* p. 131.

Coed Coch.

Corticium bupleuri, Roum. *Fungi Gall.* No. 1804. *Corticium Friesii*, *Grog. Rev. Myc. t. IV.*, p. 19. *Roum. Fungi Gall.* No. 2509.

France.

Corticium graminicolum, E. & M. N. *Amer. Fungi* No. 1717.

On *Andropogon*. N. Jersey.

Corticium reticulatum, B. & C. *Grev.* I., 180. *C. tremellinum* var. *reticulatum*, B. & C. N.A. *Fungi* No. 272.

Pennsylvania.

Corticium liquidambaris, B. & C. *Massee Mon.* p. 148.

Alabama.

Corticium spumeum, B. & Rav. *Cort. ochroleucum* var. *spumeum*, C. *ochroleucum* var. *erimosum*, *Grev.* I., 166.

On oak. S. Carolina.

Specimens sterile.

Corticium subrepandum, B. & Cooke *Grev.* VI., 81. *Massee Mon.* p. 119.

New Jersey.

Corticium subterraneum, Rabh. *F. Eur.* 1006. *Massee Mon.* p. 145.

Saxony.

Corticium xanthellum, B. & C.

Venezuela. = barren mycelium only.

Corticium cretaceum, *Fries Obs.* I., 153.

Europe, America, etc.

Coniophora sistotremoides (*Schw.*) *Thelephora sistotremoides*, *Schwein. Syn. Car.* 1053.

Spores elliptic, olive brown, $12 \times 8 \mu$.

Coniophora atrovirens (*Fries*). *Corticium atrovirens*, *Sacc. Syll.* 7540

Coniophora indica (*B.*), *Mass. Mon.* p. 134.

Bombay.

NEW GENUS, SARCOMYCES.

Mr. G. Massee has characterized a new genus of *Bulgaricæ* in the following terms:—

SARCOMYCES, *Massee*.

Receptacle subgelatinous, subsessile, erumpent, attached by a narrow base; hymenium convex, even, margin acute; asci cylindrical, sporidia uniseriate, coloured, muriformly septate; paraphyses numerous.

Allied to *Hæmatomyxa*, *Sacc.*, but distinguished by the even

marginate hymenium and the uniseriate sporidia. It is doubtful whether the last-named genus really belongs to the *Bulgariæ*.

Sarcomyces vinosa, Mass. *Tremella vinosa*, Berk & Curt.

Erumpent; substipitate, expanding into a more or less circular fleshy disc, plane or convex below, margin acute, patent when moist, incurved when dry; hymenium convex, even, every part perfectly glabrous and dark purple brown; asci cylindrical, attenuated and usually curved at the base; sporidia uniseriate, four in an ascus, elliptical, ends subacute, usually rather oblique, at first triseptate, then with septa formed parallel to the long axis of the spore, slightly, or not at all constricted at the septa, clear brown, $21-24 \times 8-10 \mu$; paraphyses linear, colourless, not incrassated at the tips, aseptate, equal in length to the asci, very numerous, $2-5 \mu$ thick.

On wood. Venezuela, S. Carolina.

From two-thirds to one inch across, solitary, or two to three in clusters, subgelatinous when moist, cartilaginous and much contracted when dry. With very much the habit and general appearance of *Bulgaria inquinans*, but of a dark purple colour.

The above diagnoses are taken from the "Journal of Mycology," Vol. vi., p. 178, and the specimens are in the Royal Herbarium, Kew.

FUNGUS FORAYS, 1891.

Consequent on the unsettled state of the weather the fixtures for the Fungus Forays for this year are still rather indefinite.

CRYPTOGAMIC SOCIETY OF SCOTLAND.—The seventeenth annual conference will be held at Paisley, on Tuesday, the 22nd September.

WOOLHOPE FIELD CLUB.—It is proposed to hold the annual meetings for Fungus Forays during the first week in October, but the details are not yet determined.

ESSEX FIELD CLUB.—The present suggestion for the annual Fungus Foray is to the effect that it shall take place in September, and the locality Hatfield Forest. Further particulars will be determined soon.

HAMPSHIRE FIELD CLUB.—A desire has been expressed to hold a Fungus Excursion on one of the Fridays in September in the Stratton Woods and Park. To meet at the Micheldean Station.

Thus it will be seen that none of the dates are absolutely determined, except the first, and therefore all who are interested will have to secure more definite information as the time approaches. Up to the present the prospects are not more favourable than they have been during the past two years. A week or two of fine warm weather may make an improvement.

NOTES ON TREMELLINI.

The following species are not to be traced in *Saccardo Sylloge*.

Dacryomyces conigenus, *Niessl. in Wint. Fungi Eur. No. 2628.*

On cones of *Pinus sylvestris*.

Dacryomyces Poæ, *Libert. Pl. Crypt. 135.*

On leaves of *Poa sudetica*.

Dacryomyces pallens, *Fries. Fekl. Fun. Rhen. 2092.*

On branches.

Dacryomyces phaseoli, *Dur.*

On leaves.

Dacryomyces violaceus, *Schwein. Syn. Car. 1148.*

On bark.

Peziza myceticola, *Berk. & Curt. U. S. Fungi.*

On rotten fungi.

Peziza porinatum, *Cooke.*

On decaying *Polyporus*.

These are both of the nature of *Dacryomyces*.

Auricularia corium, *Berk. in Herb. Merulius corium, Ayres MSS.*

Pileo effuso-reflexo, sublobato vel crenulato, villosa, fasciato-zonato, cervino; hymenio atro-purpureo, plicis distinctissime reticulato-venoso, sporis subglobosis, $7\ \mu$.

On dead trunks. Mauritius.

Auricularia epitricha, *Berk. in Herb. Auricularia Carteri, Berk.*

Suborbicularis, gregaria, margine recurvo, subtus pallido, velutino, hymenio umbrino, subolivascence, lævi, pruinoso. Sporis $5 \times 4\ \mu$.

On bark. Bombay. Neilgherries.

What clue is there in *Saccardo Sylloge* as to the disposal of *Tremella disciformis*, *Fries Syst. Myc. 11., 216?*

Tremella lilacina, *Mull.*, seems to be the same as *T. sarcoides* from Sealer's Cove, Victoria.

It seems impossible to trace, without index to synonymy, *Ditangium insigne*, *Karst. Fun. Fenn. No. 656.*

EXOTIC FUNGI.

By M. C. COOKE.

Cordyceps Speeringii, *Massee.*

Stroma minute ($\frac{1}{2}$ -1 c.m. high), ochraceous white, stem cylindrical, a little attenuated below; capitulum subglobose, punctate with the immersed perithecia. Asci cylindrically clavate, octosporous; sporidia linear, flexuous, five septate, not breaking up into joints, $60 \times 1\frac{1}{2}\ \mu$.

On Ant (*Formica*). Grenada, W. Indies.

Sphærostilbe Macowani (*Korb.*).

The species described by Koerber in the *Österreichische Botanische Zeitschrift*, 1877, p. 357, under the name of *Coniocybe Owani*, according to specimens issued by Arnold, No. 817, are distinctly a *Sphærostilbe*, the perithecia being scattered in fissures of the bark, but with the sporidia immature. The *Stilbum* reaches 2 m.m. in height and the conidia are $5 \times 3 \mu$.

On bark. Cape of Good Hope.

Uredo (Uromyces ?) aloes, *Cooke*.

Spots suborbicular or confluent, pallid; sori convex, large, circling or clustered on the spots, often confluent, for a long time covered. Spores elliptical or subglobose, smooth, with a thick epispore ($25-30 \times 20 \mu$), pedicels hyaline.

On leaves of *Aloë*. Mooi River, Natal. (*J. M. Wood*, 4511).

BRITISH TREMELLINÆ.

REVISED BY M. C. COOKE.

TREMELLINÆ, *Fries*.

Whole fungus homogeneous, gelatinous, collapsing when dry, reviving when moistened, internally composed of branched filaments, terminating in basidia at the periphery. Basidia tapering, undivided or furcate at the apex, or globose, cruciately divided; spores somewhat kidney-shaped or globose, continuous, germinating and producing sporidioles.

Sub-Fam. 1. AURICULARIÆ. Basidia elongated or fusoid, plurilocular.

AURICULARIA, *Bull.*

Coriaceous fungi, resembling *Stereum*, effused and reflexed, hymenium gelatinous, reticulately ribbed.

Auricularia mesenterica (*Dicks.*), *Fries Hym. Eur.* 646. *Cke. Hdbk.* No. 919.

Pilei resupinate, then reflexed, entire, villous, zoned and fasciate, brownish cinereous, hymenium costato-plicate, brownish violet; spores oblong, kidney-shaped, $20 \times 7 \mu$.

On trunks.

Auricularia lobata, *Somm. Fries Hym. Eur.* 646. *Cke. Hdbk.* 920.

Pileus effuso-reflexed, lobed, variegated with strigose or tomentose velvety or smooth zones, brownish white, hymenium livid tawny; folds distant, reticulated; spores as in the above.

On bark.

HIRNEOLA, *Fries.*

Membranaceous fungi, often cup-shaped or ear-shaped, cartilaginous when dry; hymenium gelatinous, even or plicate.

Hirneola auricula *Judæ*, *Linn. Fries Hym. Eur.* 695. *Cke. Hdbk.* 1032.

Thin, concave, flexuous, blackish, venoso-plicate everywhere, tomentose beneath, cinereous olive. Spores reniform, $20-25 \times 7-9 \mu$.

On elder trunks.

Hirneola polytricha, *Mont.*

Has occurred in this country on imported timber, but is not indigenous.

Sub-Fam. 2. TREMELLINÆ, *Bref.* Basidia globose, or ovoid, when mature longitudinally quadripartite in a cruciate manner, rarely continuous.

EXIDIA, *Fries.*

Fungi cup-shaped, truncate or effused, often papillose; spores reniform, continuous for some time, when germinating two or more celled, producing curved sporidioles.

Exidia recisa, *Fries Hym. Eur.* 693. *Cke. Hdbk.* 1029.

Very soft, truncate, plane, costate, sub-repand, amber-brown, punctate, scabrous beneath; stem very short, excentric, oblique; spores oblong, $13-20 \times 2-7 \mu$.

On branches of willow.

Exidia glandulosa, *Bull. Fr. Hym. Eur.* 694. *Cke. Hdbk.* 1030.

Effused, flattened, thick, undulate, blackish, spiculose with conical papillæ, cinereous beneath, and somewhat tomentose. Spores oblong, curved, $12-14 \times 4-5 \mu$.

On trunks of oak.

Exidia albida (*Huds.*). *Tremella albida*, *Fr. Hym. Eur.* 691. *Cke. Hdbk.* No. 1020.

Ascending, tough, expanded, undulate, subgyrose, pruinose, whitish, when dry brownish; spores oblong, obtuse, curved, biguttulate, subhyaline, $12-14 \times 4-6 \mu$.

On branches.

ULOCOLLA, *Bref.*

Pulvinate, gyrose fungi. Spores continuous at first, then bicellular and reniform, germinating and producing rod-like conidia.

Ulocolla saccharina, *Fries Hym. Eur.* 694. *Exidia*, *Cke. Hdbk.* No. 1031.

Tuberculose, gyrosely-undulate, tawny cinnamon; spores reniform, $10-12 \times 5-6 \mu$, conidia about the same size.

On larch.

Ulocolla foliacea (*Pers.*) *Tremella*, *Fries Hym. Eur.* 690. *Cke. Hdbk. No.* 1015.

Cæspitose, flaccid, even, diaphanous, undulated, flesh coloured cinnamon, plicate at the base, spores reniform, $10-12 \times 5-6 \mu$, with similar conidia.

On stumps.

TREMELLA, *Fries.*

Pulvinate or effused, brain-like, gelatinous, usually smooth. Spores conidia and sporidioles globose or ovoid, always continuous.

Sect. I. MESENTERIFORMES.

Tremella fimbriata (*Pers.*), *Fries Hym. Eur.* 690. *Cke. Hdbk. No.* 1013.

Cæspitose, erect, corrugated, blackish olive; lobes flaccid, margin incised, undulate-fimbriate.

On branches.

Tremella frondoso, *Fr. Hym. Eur.* 690. *Cke. Hdbk. No.* 1014.

Cæspitose, very large, even, pallid yellow; plicate at the base, lobes gyrosely-undulate, casidia globose (15μ), spores globose, $10-12 \mu$ diam.

On trunks, oak, etc.

Tremella lutescens (*Pers.*), *Fr. Hym. Eur.* 690. *Cke. Hdbk. No.* 1016.

Cæspitose, tremulous, undulately gyrose, white, then yellowish, lobes crowded, entire spores globose, $12-15 \mu$ diam., sporidioles globose, $1\frac{1}{2}-2 \mu$ diam.

On stumps.

Sect. II. CEREBRINÆ.

Tremella mesenterica, *Retz. Fr. Hym. Eur.* 691. *Cke. Hdbk. No.* 1017.

Expanded, ascending, somewhat tough, plicate-undulate, smooth, orange; spores shortly ellipsoid, $6-8 \mu$ diam.

On branches.

Tremella intumescens, *Engl. Bot. t.* 1870. *Fr. Hym. Eur.* 691. *Cke. Hdbk. No.* 1021.

Subcæspitose, rounded or conglomerate, soft, brown, blackish brown when dry, obsoletely punctate, somewhat tortuous and lobed, spores $12-14 \times 3-4 \mu$.

On trunks.

Tremella vesicaria, *Bull. t.* 427, *f.* 3. *Fr. Hym. Eur.* 691. *Cke. Hdbk. No.* 1018.

Firm, bladdery, much waved and wrinkled, erect, pallid, very viscid within; spores $10 \times 6 \mu$.

On the ground.

Sect. III. CRUSTACEÆ.

Tremella viscosa, *Berk. Out.* 288. *Fr. Hym. Eur.* 691. *Cke. Hdbk.* No. 1027.

Effused, resupinate, hyaline, at first white, undulated; spores globose or ellipsoid, $7-9 \times 6-7 \mu$.

On rotten wood.

Tremella epigæa, *Berk. & Br. Notices* No. 373. *Cke. Hdbk.* No. 1028. *Fr. Hym. Eur.* 692.

Effused, gelatinous, gyroso-plicate, white; spores subglobose, $6 \times 4 \mu$.

On naked ground.

Sect. IV. TUBERCULIFORMES.

Tremella indecorata, *Somm. Fr. Hym. Eur.* 692. *Cke. Hdbk.* No. 1022.

Sessile, rounded, moist, convex, plicate, opaque, when dry black-brown, dingy; spores globulose, $7-9 \mu$ diam.

On willow and poplar.

Tremella moriformis, *Berk. Out.* 217. *Fr. Hym. Eur.* 692. *Cke. Hdbk.* 1019.

Conglobated, sinuated, mulberry black, opaque, firm; spores ovoid, yellowish, 16μ long.

On rotten wood.

Tremella tubercularia, *Berk. Outl.* 288. *Fr. Hym. Eur.* 692. *Cke. Hdbk.* No. 1024.

Erumpent; stem short, cylindrical, head plicate, dirty white, nearly black when dry; conidia $2 \times \frac{1}{2} \mu$.

On oak branches.

Tremella versicolor, *Berk. Outl.* 288. *Fr. Hym. Eur.* 693. *Cke. Hdbk.* No. 1026.

Minute, orbicular, orange, at length brown; spores subglobose $6 \times 4 \mu$.

On *Corticium nudum*.

Tremella atrovirens, *Fr. Syst. Myc.* II., 232.

Erumpent, disciform, very minutely papillate and rugose, when moist sooty green, black when dry, gregarious or confluent (1 m.m. diam.); threads filiform, swollen at the apex into globose, cruciately septate, olive basidia; spores ellipsoid, subapiculate, $12-15 \times 10-13 \mu$.

On dead branches of *Sarothamnus*.

APPENDIX.

Tremella sarcoides (*Dicks.*), *Cke. Hdbk. sub.* No. 1023.

Cæspitose, soft, viscid, pallid, flesh colour, at first club-shaped, then compressed, lobed and plicate, basidia repeatedly dichotomously branched, conidia ovate, $4-6 \times 3 \mu$.

On trunks.

= Conidia of *Coryne sarcoides*.

Tremella clavata, *Pers. Ic. Pict. t. 10, f. 1. Fr. Epic. 589. Cke. Hdbk. 1023.*

Solitary, simple, incrassated, fleshy red, becoming black at the base.

On branches.

NÆMATELIA, *Fries.*

Solid, convex, with a firm, fleshy nucleus; basidia globulose, cruciate; spores ovoid, continuous.

Næmatelia encephala (*Willd.*), *Fr. Hym. Eur. 696. Cke. Hdbk. No. 1033.*

Subsessile, pulvinate, plicately rugose, pale flesh colour; sporophores filiform, short, $2\ \mu$ thick, swollen at the apex in globose basidia, at first guttulate, then 2-4 septate, pale flesh colour; spores globose, pear-shaped, $15-18\ \mu$ diam.

On pine branches.

Næmatelia nucleata (*Schw.*), *Fr. Hym. Eur. 696. Cke. Hdbk. 1034.*

Sessile, flattened, somewhat gyrose, whitish, then tawny yellow; spores ovoid, $7\ \mu$ long.

On rotten road.

Næmatelia virescens, *Corda. Ic. III., f. 90. Fr. Hym. Eur. 696. Cke. Hdbk. 1035.*

Sessile, suborbicular, depressed, gyrose-tuberculate, greenish; basidia spherical; spores ovoid, apiculate, $18 \times 11\ \mu$.

On wood.

GYROCEPHALUS, *Pers.*

Erect, spathulate; basidia normal; spores ovate-pyriform, continuous.

Gyrocephalus rufus (*Jacq.*). *Guepinia helvelloides, Fr. Hym. Eur. 697.*

Erect, substipitate, variable, subspathulate, rosy orange, becoming reddish, hymenium inferior, smooth; spores ovoid, apiculate at the base, $12-15 \times 8-10\ \mu$.

On the ground.

Sub-Fam. 3. DACRYOMYCETÆ, Bref.

Basidia tapering, clavate, furcate above, the tips at each end sterigmate.

DACRYOMYCES, *Nees.*

Pulvinate gyrose; spores when mature or in germination transversely or murally divided; conidia catenulate.

Dacryomyces macrosporus, *Berk. & Br. No. 1374. Fr. Hym. Eur. 698.*

Gelatinous, tuberculate, rosy, spores oblong, then 3-5 septate, constricted at the joints.

On branches.

Dacryomyces deliquescens (Bull.), *Fr. Hym. Eur.* 698. *Cke. Hdbk.* 1038.

Roundish, rooting, convex, immarginate, yellowish, at length twisted, hyaline; spores oblong, curved, triseptate, $15-16 \times 6-7 \mu$.
On pine wood.

Dacryomyces stillatus, *Nees. Syst. p.* 89. *Fr. Hym. Eur.* 699. *Cke. Hdbk.* 1039.

Somewhat round, convex, at length plicate, yellow or orange, colour persistent, spores multiseptate, $18-22 \times 8 \mu$.
On rotten wood, etc.

Dacryomyces chrysocomus (Bull.), *Fr. Hym. Eur.* 669. *Cke. Hdbk.* 1040.

Orbicular, golden yellow, spherical when young, immarginate, soon collapsed, peziza-like, at length flattened, persistently smooth; spores multiseptate, ellipsoid, diluted yellowish, $20-28 \times 9-11 \mu$.

On rotten pine wood.

Dacryomyces succineus, *Fr. Hym. Eur.* 699.

Gregarious, punctiform, somewhat gelatinous, smooth, amber, externally growing pale when moist, disc darker and immarginate spores cylindrical, straight, obtuse, 2 guttulate, hyaline, $14 \times 2 \mu$.

On pine leaves.

Dacryomyces sebaceus, *Berk. & Br. No.* 1305. *Fr. Hym. Eur.* 699. *Cke. Hdbk.* 1037.

Somewhat rounded, cup-shaped, whitish, internally composed of branched filaments, somewhat clavate above (sporophores); spores multiseptate, $12\frac{1}{2} \times 7\frac{1}{2} \mu$.

On branches.

Dacryomyces torta (Berk.). *Tremella, Fr. Hym. Eur.* 692. *Cke. Hdbk. No.* 1025.

Minute, round, depressed, gyrose-tuberculate, yellow or orange; spores cylindrical, curved, triseptate, $12 \times 4-5 \mu$.

On decorticated oak.

Dacryomyces (?) vermiformis, *Berk. & Br. No.* 1700.

Minute, grey, worm-shaped, sporophores globose, $12\frac{1}{2} \mu$; spores globose, pallid rufous, 5μ diam.

On rotten wood.

GUEPINIA, Fries.

Unequally cup-shaped, often stipitate, disc sporebearing; conidia developed externally on the excipulum.

Guepinia peziza, *Tul. Ann. Sci. Nat.* 1853.

Cup-shaped, sessile, smooth, yellow, adnate behind, stem slender; spores oblong ellipsoid, at first simple, then 1-3 septate, $10-13 \times 4-6 \mu$, on rather clavate sporophores.

On dead branches.

DITIOLA, *Fries.*

Between coriaceous and corky, hymenium discoid, gelatinous ; spores continuous at length uniseptate.

Ditiola radicata (*A. & S.*), *Fr. Sys. Myc.* II. 170. *Cke. Hdbk.* 1044.

Stipitate or rooting ; cups nearly plane, disc golden yellow, stem thick, white ; spores subellipsoid, for the most part curved or unequal, uniseptate, $8-12 \times 4-5 \mu$.

On wood.

APYRENIUM, *Fries.*

Subglobose, sessile, internally hollow, externally subgelatinous ; spores continuous.

Apyrenium lignatile, *Fr. Hym. Eur.* 700. *Grev. Crypt. t.* 276. *Cke. Hdbk.* 1041.

Rounded, deformed, externally and internally pallid ; spores rounded.

On pine wood.

Apyrenium armeniacum, *Berk. & Br. No.* 1141, *t.* 2, *f.* 2. *Cke. Hdbk. No.* 1042.

Lobed, subgelatinous, peach colour ; spores obovate, $13 \times 8 \mu$, hyaline, basidia filiform, branched.

On wood.

MEMORABILIA.

Strobilomyces polypyramis, *Hook. in Berk. Decades No.* 332.

On the ground. Jillapahar, India.

This species has been omitted from Saccardo's Sylloge.

Spegazzinia tessarthra (*B. & C.*), *Sacc. Syll.* IV., *No.* 3582.

From the figures it would appear that the species described by Patouillard under the name of *Triposporium cristatum*, *Bull. Soc. Mycol. France*, 1888, p. 125, is none other than this species, which was called *Sporidesmium tessarthrum*, *B. & C.*, and *Tetrachia tessarthra*, *Berk.*

MISSING LINKS.—We should be glad to find the following in Saccardo's Sylloge, but at present have not been successful :—

Colletotrichum microspermum, *Corda Icon.*

Zasmidium cellare, *Fries.*

Alytosporium fulvum, *Fries.*

Alytosporium croceum, *Schw.*

Alytosporium pteridicola, *Schw.*

ON DACRYOPSIS, *Massee*.

The above new genus has been characterized by Mr. Massee in the "Journal of Mycology" for 1891, p. 180, for a group of Tremelloid Fungi.

DACRYOPSIS, *Massee*.

Small gelatinous fungi, fertile portion capitate, sharply defined, terminal on a more or less elongated stem, composed of parallel simple or branched septate hyphæ; at the apex of the stem the hyphæ are very much interlaced, forming a compact expanded layer, from which originate in first instance numerous slender gonidiophores, spreading on every side to form a more or less capitate head; gonidia minute, one celled, forming a dense layer; basidia cylindrical, bifurcate, aseptate, springing from the interlaced layer of hyphæ at the apex of the stem, either contemporaneous with, or later than the gonidiophores. Spores simple or septate. = *Coryne*, Berk., in part.

During the gonidial stage the structure is identical with that of *Tubercularia*, the stem is often more elongated than in the last named genus, but in *Dacryopsis nuda* even this unimportant difference disappears. The basidiæ and spores closely resemble those met with in *Dacryomyces*, to which genus the present is closely allied, differing in the structure of the stem, and in the arrangement and form of the gonidiophores.

The gonideal phase of *Dacryopsis nuda* is morphologically almost indistinguishable from the form-species known as *Tubercularia vulgaris*, but it is well known that the latter is the gonideal condition of the ascigerous fungus called *Nectria cennabarina*, hence it is seen that two structures almost indistinguishable in the gonideal form may be conditions of Ascomycetous and Basidiomycetous fungi respectively. Again it is known that the gonideal condition of various species of *Nectria* belong to such morphologically distinct form genera as *Tubercularia*, *Fusidium*, *Volutella*, etc.; consequently it appears to be at least indiscreet to assume, much more to assert, that because a gonideal form presenting certain morphological features has been clearly proved to be a condition of some higher fungus, belonging to a given genus, that another gonideal form of similar structure must necessarily be a condition of some hypothetical species of the same genus. Such assumptions do not harmonize with the stated belief of those mycologists who consider that a complete life history is necessary to prove relationship, or otherwise, in suspected cases, a belief that has brought conviction to the mind of most disciples of the Friesian school, whose conceptions of affinity are based on characters derived from mature examples, which in many instances are of no genetic value. On the other hand, it is to be regretted that the modern school, having adopted the only

reliable test of affinity—life history—should endeavour to indicate affinity from analogy to such an extent as is too frequently done. The close morphological agreement between the gonideal condition in the present genus and in *Coryne* further illustrates the same idea.

Dacryopsis gyrocephala, *Mass.* *Coryne gyrocephala*, *B. & C.*, *Grev.* II., 20.

Gregarious or scattered; head hemispherical, plane below, with ridges arranged in a gyrose manner, dark purple, blackish purple when dry; stem equal or slightly incrassate above, smooth, even, pale, tan coloured, $2-3\frac{1}{2}$ millim. long, $1\frac{1}{2}$ mill. thick; gonidiophores covering every part of the head, simple, aseptate, straight, $40-50 \times 1\frac{1}{2} \mu$; gonidia terminal, continuous, colourless, elliptic-oblong, $2\frac{1}{2} \times 1 \mu$; basidia projecting beyond the gonidiophores, aseptate cylindrical, bifurcate near the apex, $60-65 \times 6-7 \mu$; spores continuous, colourless, elliptic-oblong, slightly curved, with an oblique apiculus at the base, $15-16 \times 4-4\frac{1}{2} \mu$; clavate, paraphyses numerous, shorter than the gonidiophores.

On rotten wood. Lower Carolina.

Dacryopsis Ellisiana, *Mass.* *Coryne Ellisii*, *Berk. Grev.* II., 33.

Gregarious, head broadly elliptical or elliptic-oblong, smooth, even, pale brown, $4-6 \times 2-4$ mill., stem cylindrical, longitudinally wrinkled, $3-4 \times 1\frac{1}{2}-2$ mill., dark brown; gonidiophores covering the entire head, straight, septate, with 1-3 short branchlets near the apex, $40-50 \times 2\frac{1}{2} \mu$; gonidia continuous, colourless, elliptic-oblong, very slightly curved, $3 \times 1 \mu$; basidia cylindrical, bifurcate at the apex, aseptate, $50-55 \times 6 \mu$; spores elliptic-oblong, with an oblique apiculus at the base, $14 \times 5 \mu$.

On decaying basswood log. New York.

Dacryopsis unicolor, *Massee.* *Coryne unicolor*, *Berk. & Curt.*

Gregarious, entire fungus blackish brown; head globose, small, smooth, even, $1\frac{1}{2}-2$ mill. diam.; stem elongated, erect, slightly attenuated upwards, vaguely longitudinally rugulose, $5-8 \times 1-1\frac{1}{2}$ mill.; gonidiophores covering every portion of the head, linear, curved, septate, with a few short lateral branchlets, $70-80 \times 1\frac{1}{2} \mu$; gonidia elliptic, oblong, continuous, colourless, $3 \times 1 \mu$; basidia appearing after the gonidiophores, aseptate, bifurcate at the apex, $45-50 \times 5-6 \mu$. Spores continuous, colourless, elliptic-oblong, with an oblique apiculus at the base, $15 \times 4-4\frac{1}{2} \mu$.

On rotten wood. Cuba.

Dacryopsis nuda, *Massee.* *Ditiola nuda*, *Berk. Ann. Nat. Hist.*, Ser. II., Vol. II., 267.

Gregarious; head hemispherical, flattened below, at first even, then minutely rugulose, reddish orange, 3-4 mill. diam. Stem short, stout, equal, white, or tinged with yellow, minutely tomentose, $3-4 \times 2-2\frac{1}{2}$ mill., even; gonidiophores appearing before the basidia, linear, straight, aseptate, simple, or rarely with one or two short branchlets near the apex, $35-40 \times 1\frac{1}{2} \mu$; gonidia

elliptic-oblong, continuous, colourless, $3 \times 1 \mu$; basidia projecting considerably above the gonidiophores, cylindrical, bifurcate at the apex, $55-60 \times 5-6 \mu$. Spores elliptic-oblong, colourless, with an oblique apiculus at the base, triseptate, $14 \times 5 \mu$.

On fir stumps. Britain.

Coryne rugipes, Cooke Grev. VIII., 58. *Ombrophila*, Sacc. Syll. VII., 2536.

Is allied, and not ascigerous.

NEW BRITISH FUNGI.

By M. C. COOKE.

Agaricus (Flammula) Aldridgei, Massee.

Pileus convex, then infundibuliform ($1\frac{1}{2}$ -2 in.), with a somewhat involute margin, dry, velvety, testaceous with a tinge of orange. Stem slender, equal, flexuous, hollow (4 in. by $\frac{1}{4}$ or $\frac{1}{3}$ in.), smooth, of the same colour, with a white floccose mycelium at the base. Gills deeply decurrent, rather crowded, lanceolate, golden yellow, becoming ferruginous yellow. Spores slightly apiculate at the base, $16 \times 5 \mu$.

On the ground. Petersfield.

A remarkably distinct and characteristic species, near *A. gymnopodius*.

Paxillus subinvolutus, Batsch fig. 204. *Inocybe subinvoluta*, Sacc. Syll. 613.

On a careful consideration of the original description and figure, and comparison with living specimens, we have come to the conclusion that the species of Batsch was really a *Paxillus*, with a rather lateral stem, and gills parting from the pileus. Spores amber, $7 \times 5 \mu$.

On the ground. Sussex.

The following is the description given by Batsch to accompany his figure:—

Pileus subfoveatus, et subobliquus, margine exteriore deflexus, eximio inferne demum arcte involutus, superficie glaber, et margine convexo, citius attenuato, excepto, fere totus constans e stipitis crassi terminali dilatatione, stipitis crassitem non multum excedente. Stipes validus strictus, rudis, superficie subæqualis, nitoris expers, rugis obliquis coalescentibus in infera parte obductus, paullulum elatis, sed primum crebro contactu clarioribus; superne versus lamellas tomentosus. Color magis in carnem vergit. Basis obtusa terræ innascitur. Lamellæ elongatæ longiores, sensim stipiti effusæ; secundi ordinis oblongæ, pone obliquæ truncatæ, una cum prioribus integræ, pileo parallelæ; tertii ordinis marginales minutæ, oblongæ, inferne convexæ. Omnes nec ultra modum angustatæ, nec coalescentes; substantia pallida, vix in colorem ochraceo-livescens vergens, medullosa, solum in cortice fibrosa, obscurior, uda.

HOST-INDEX OF U.S. FUNGI.*

We have before us the third and final part of this work, which will doubtless prove of considerable value to the mycologists of America. It may be taken for granted that any work associated with the name of Professor W. G. Farlow will be carefully and conscientiously executed. In Europe such indices are not numerous, and certainly not up to date. Westendorp constructed a small general Index in 1854 to 1865, and subsequently C. Roumeguere (in 1870) issued a similar work, but neither of these are sufficiently complete now to be of much service. It is matter of opinion whether it serves any useful purpose to include, for instance, *Cladosporium herbarum* over and over again, upon different hosts, when it is common to so many, and special to none. The difficulty is in drawing the line of exclusion, and yet no one would regard *Corticium leve* or *Poria vaporaria* as confined, or even having a predilection for any single host.

In the present list an advance is made on its predecessors in including the recent synonyms, and especially those adopted by Saccardo in his "Sylloge." How this has been done may be gathered from the following reprint of the supplementary names given in the Appendix for

PYRUS MALUS, L.

- Agaricus adiposus, *Fr.*
- { Agaricus pulvinatus, *P.*
- { Pleurotus pulvinatus, *Sacc.*
- Ceratostomella mali, *Ell. & Ev.*
- Cercospora mali, *Ell. & Ev.*
- Clitopilus conissans, *Pk.*
- Didymella mali, *Ell. & Ev.*
- Entomosporium maculatum, *Lev.*
- { Glæosporium fructigenum, *B.*
- { Glæosporium versicolor, *B. & C.*
- Hendersonia foliorum, *Fckl.*
- Hendersonia mali, *Thum.*
- Hypoxyton Morsei, *B. & C.*
- { Monilia fructigena, *P.*
- { Oidium fructigenum, *Kze. & S.*
- Nectria mammoidea, *P. & Plow.*
- Ozonium auricomum, *Lk.*
- { Peziza inquinans, *Cke.*
- { Patinella inquinans, *Sacc.*
- { Peziza regalis, *C. & E.*
- { Pezizella regalis, *Sacc.*
- Phoma piricola, *Ell. & Ev.*
- Phyllosticta pirina, *Sacc.*
- { Podosphæra Kunzei, *Lev.*
- { Podosphæra oxyacanthæ, *(D.C.)*

* "A Provisional Host-Index of the Fungi of the United States," by W. G. Farlow and A. B. Seymour, 1891.

- {*Sphæria collapsa*, S.
- {*Sphærella collapsa*, Cke.
- Sphærella sentina* (Fr.), Sacc.
- {*Sphæria subbullans*, S.
- {*Sphærella subbullans*, Cke.
- Sphæropsis malorum*, B.
- Sphæropsis malorum*, B., var. *foliicola*, E. & E.
- Sporotrichum cinereum*, Fk.
- Polyporus igniarius* (L.), Fr.

By the way, we hardly see the grounds for the omission, under the last name, of the synonym

Fomes igniarius (L.), Fr.

We observe another divergence from previous host-indices, in that the particular part of the plant is not named upon which the parasite is seated. It has been customary to group them together, as found upon, either the wood, bark, leaves, flowers, fruit, etc. This is not a very important omission, but it is a new departure. Considering the vast amount of labour involved in the production of such an Index, it would be most unfair to complain that it is not absolutely perfect. For the United States it is the only one, and for a general Index it is an important advance and aid, should any industrious Teuton determine to follow suit.

Finally, this work exhibits the vast strides which the science of mycology has made in the States during the past quarter of a century, through the perseverance of a few earnest men. To them it is a record and a testimonial. The next work we are anticipating is a monograph of the *Pyrenomycetes*. It will be some years before we may hope for a complete synopsis of the Fungi of the United States.

APPLE SCAB.

Fusicladium dendriticum.

We have this year received strongly developed specimens of this fungus on the leaves of the apple, from different parts of the country, and from Australia a profusion of examples. The fungus and its ravages are generally so well known that we may dispense with a description, but we will offer some observations on the remedies which have been proposed in the United States, where the pest is plentiful, as detailed in the report of the Commissioner of Agriculture. There remains no doubt, as we suggested in 1873, that the fungus on the leaves and the fruit is practically the same.

The fungus appears to be retarded by the heat of summer. Its most rapid growth takes place during moist cool weather, such as we have had prevailing for a long time. On the treatment of this pest the report in question states: "The fungus of the apple scab does not penetrate into the tissues of the host, and very early in its development it is wholly exposed to any application which may be made to destroy it. It appears, however, that the vegetative

portion, or plant body, of this as well as of many other fungi, is very resistant to the action of chemical reagents quite as much or more so than are the tissues of the leaf or apple upon which it grows. We can scarcely hope, therefore, to accomplish its destruction, unless it be the growths infesting the young shoots and the scales of buds. Before the latter expand in the spring much stronger solutions can be applied than it is possible to use later in the season, and it is at this period that the warfare against this fungus should begin. It has been observed that the germination of the spores is wholly prevented in very dilute solutions of copper, and our chief dependence in combating this disease appears to rest upon this fact, the possibility of preventing the germination of the spores where they can do harm. A practical treatment has been discovered by which we may prevent the germination of the spores of the downy mildew of the grape vine, by applying various solutions of sulphate of copper to the surface of the leaves upon which the spores of the fungus fall. It is doubtless equally practical to accomplish by a similar treatment a like result in the case of the *Fusicladium* of the apple. Experiments already made with the sulphate of copper solutions indicate that they will, when properly applied, at once check the 'scab.' Further and more systematically conducted experiments are required in order to determine fully what preparation is most efficacious, at what season it is best to make the application, and the strength to which the solutions must be limited. Where *eau celeste*, prepared according to the original formula, has been tried it has severely burned and injured the foliage. This preparation may be rendered less caustic by the addition of ordinary carbonate of soda."

"Another and more simple modification of the *eau celeste* is prepared by dissolving in one quart of liquid ammonia, four to six ounces of carbonate of copper, then dilute with water to 25 gallons. The ammonia and carbonate of copper solution may be kept in a bottle and diluted when required for use at the rate of about one ounce of the solution to the gallon of water. Those who have used this preparation on the grape vine say it is perfectly harmless to the foliage, and is as efficient against mildew as *eau celeste*.

"Simple solutions of sulphate of copper should not be employed during the growing season, as their use is almost certain to result in injury to the foliage. The Bordeaux mixture may be used at any time without fear of injury. In using one or the other of these preparations the following course of treatment is suggested:—

"(1) In early spring, before the buds have commenced to expand, spray the trees thoroughly with a solution of sulphate of iron, using four pounds of the iron sulphate to four gallons of water.

"(2) As soon as the fruit has set, apply the Bordeaux mixture, or one of the modified preparations of *eau celeste*.

"(3) If the weather should be such as to favour the development of the 'scab' fungus, a third application should be made two or three weeks after the second, using the same materials.

"In addition to the effect that these applications may have on the development of the fungus, they will doubtless serve to keep off many insect pests.

"In storing the fruit for the winter, especial care should be taken to separate all the apples showing any signs of the scab from those which are smooth and healthy, and they should all be kept in rooms or cellars free from moisture."

These are the sum total of the recommendations which have been made, but we have no positive information as to the practical results.

CEYLON IN AUSTRALIA.

BY THE EDITOR.

Curious facts in geographical distribution are constantly presenting themselves to those who have any extensive experience in the plants, especially the fungi of distant regions. It is of common knowledge that such species as *Schizophyllum commune*, *Fomes lucidus*, *Polystictus occidentalis*, *Polystictus sanguineus*, *Stereum lobatum*, and some others, are to be met with in all countries, from warm temperate to the equator, but there are many species which are not by any means so common, or widely distributed, which occur only in countries far apart, and with broad expanses of ocean between them. There is no better illustration of this than the occurrence of Ceylon species of fungi in Australia. This is not confined to one or two species, but is manifest in several species, of which we will proceed to instance a few. There are *Agaricus (Lepiota) dolichaulos*, B. & Br., *Agaricus (Lepiota) leontoderes*, B. & Br., *Agaricus (Lepiota) aspratus*, B., *Agaricus (Lepiota) lepidophorus*, B. & Br., *Agaricus (Lepiota) rhyparophorus*, B. & Br., all Ceylon species of *Lepiota*, which occur also in some parts of Australia. In scarcely any other subgenus of *Agaricus* are so many Ceylon species found outside the limits of the island. What are the special conditions which conduce to the appearance of the above species of *Lepiota*, indigenous to Ceylon, in Australia?

Undoubtedly the climate of Australia is favourable to the growth of *Boletus* and *Strobilomyces*, but, up to the present, the only Ceylon species found in Australia is the gigantic *Boletus portentosus*, B. & Br. But Ceylon is not productive for *Boleti*, and, as far as we remember, this is the only indigenous species, and that solitary one has appeared in Queensland, quite fourteen inches in diameter of the pileus.

Amongst the *Polyporei* there is no more marked instance than the occurrence of *Polystictus Peradeniæ*, B. & Br., which, as its name indicates, was first found in Ceylon, but has since been collected in most of the Australian colonies. Whatever errors of determination there might be with fleshy putrescent fungi, there is no room for doubt in this species, which is remarkable for its distinctive character.

Irpex flavus, Kl., and *Irpex zonatus*, B., are not original Cinghalese species, but they are also Australasian, as well as somewhat common in Ceylon.

Kneiffia Muelleri, B., first found in Australia, was afterwards detected in Ceylon, and we have no record of it elsewhere.

Hymenochaete strigosa, B. & Br., was first described from Ceylon, and afterwards recognized in Australia. *Hymenochaete rhabarbarina*, B. & Br., also a Ceylon species, has been found in New Zealand.

Corticium simulans, B. & Br., in addition to Ceylon and the United States, has been collected in Australia.

Stereum pusillum, B., has only been recorded from Ceylon and Tasmania. Also *Stereum sparsum*, B., only for Ceylon and Australia.

Coniophora murina, Masee, was described from Ceylon, and since detected in Australia.

Aseröe zeylunica, B., is recorded for Ceylon and New Zealand.

Lycoperdon lilacinum, M. & B., although occurring in other localities, is also common to Ceylon and Australia.

Epichlöe cinerea, B. & Br., first received from Ceylon, has recently been collected in Australia.

Xylaria Schweinitzii, B. & C., at first from Surinam, and afterwards from Ceylon, has been more than once detected in Australia.

Far from attempting an exhaustive list of these coincidences we have only alluded to a few of the most striking which occurred to us, to serve as an illustration of our contention that there is a strange relationship between the fungi of Ceylon and Australia. Probably in the preparation of our projected "Handbook of the Fungi of Australia" we may be able to present a more complete account of these coincidences. Whatever the explanation may be, it must be remembered that the majority of the above are large, conspicuous species, and not minute parasitic fungi, which may be transported here, there, and everywhere.

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A QUARTERLY RECORD OF CRYPTOGAMIC BOTANY
AND ITS LITERATURE.

NOTES ON THELEPHOREI.

By M. C. COOKE.

Beccariella Trailii, *Cooke*.

Spathulate, or broadly obovate, entire or lobed, stipitate, thick, spongy, becoming thick towards the fimbriate margin, white, densely tomentose at the base, margin almost smooth, stem lateral, stout, cylindrical, tomentose; hymenium radiato-rugulose, ridges thin, acute, margin irregularly broken up into short, conical, tooth-like processes; spores globose, apiculate, 7-8 μ diam.

On logs. Rio Junia, Brazil. (Dr. Traill.)

From 2-4 in. across, stem $\frac{1}{2}$ - $\frac{2}{3}$ in. long, $\frac{1}{2}$ in. thick.

Beccariella Kingiana, *Massee*.

Reniform, thin, brittle when dry, and bullato-rugulose, surface woolly, ochraceous-buff, margin thin, rather fimbriate; sessile, attached by a lateral disc at the sinus; hymenium radiato-rugulose, folds not prominent, thin edged, at the margin broken up into crowded, slender, small, hair-like spines, rufous-tan when dry; spores globose, apiculate, 5 μ diam.

On rotten log in a damp place. Goping, Malay Archipelago. (Dr. G. King.)

From 3-4 in. wide, $1\frac{1}{2}$ in. broad.

Hypolyssus Sprucei, *Massee*.

Clavate, stipitate, erect, white, becoming pale fawn-colour when dry; hymenium completely surrounding the club-shaped hymenophore, smooth and waxy, very regularly longitudinally grooved, cracked when dry; sterile apex plane, minutely velvety; stem distinct, slender, minutely tomentose downwards; basidia tetrasporous, spores globose, 4 μ diam., colourless.

On wood and branches. Amazon Valley. (Spruce.)

Entire fungus about $\frac{2}{3}$ in. high.

We fail to trace the following species in Saccardo's Sylloge:—

Thelephora fusca, *Fries (?) in Libert's Supp. No. 406.*

Spores globose, spinulose, 10 μ diam., not *Corticium fuscum*, *Pers.*

Thelephora marginata, *Veuill. Rev. Myc.* 1882, p. 175. *Fungi Gallici* No. 2209.

Thelephora griseozonata, *Cooke Grev.* XIX., p. 104.
On branches. S. Carolina.

Thelephora stereoides, *Cke. & Mass. Grev.* XVIII., p. 5.
Victoria, Australia.

Thelephora tesseraria, *Berk. & Warm.* No. 8531.
Rio Janeiro.

Thelephora zygoesmoides, *Ellis N.A. Fungi* 715.
Spores globose, spinulose, 8-10 μ .
New Jersey.

Thelephora regularis, *Schwein Syn. Car.* 999.
Salem, Carolina, U.S., Zanzibar.

Thelephora Hostmanniana, *Mont. in Herb. Berk.*
Carolina, U.S.

We have not been able to find the description of this species.

Thelephora ribesia, *Fr. Syst. Myc.* I., 444. *Schwein, Amer. Bor.* 719.

Stereum modestum, *Berk. in Herb.*, is evidently *Peniophora papyrina* (*Mont.*).

Stereum prolificans, *Berk. & Br. Linn. Trans.* XVI., 41.
Cape York, Brisbane, Melbourne.

Stereum pictum, *Berk. Mass. Mon.* 185.
Brazil.

Stereum fissum, *Berk. Hook. Journ., Dec.*, No. 603. *Mass. Mon.* 169.
Brazil.

Stereum fodinarum, *Mont. Ann. Sci. Nat., Ser.* III.
Spain.

We do not find the description, as indicated on the specimen from Montagne in *Herb. Berk.*

Stereum Haydeni, *Berk. in Herb. Mass. Mon.* 199.
Ohio.

Stereum inconcinnum, *Berk. in Herb.*, is *Auricularia*.
New Orleans (Drummond).

Stereum Kurzeanum, *Cooke in Grev.* XVIII., 55.
Java (Kurz).

Stereum phalenarum, *Kalch.*, is *Stereum prolificans*, *B. & Br.*

Stereum rigens, *Karst. Ryssl. Hattsvam; Thum. Myc. Univ.* 2111. Roum.
Fungi Gallici 4809.

Stereum Schraderi, *Thumen*, is *Stereum striatum*, *Fries.*

Stereum venustulum (*Sp.*), *Thelephora vennstula*, *Speg. F. Guar.* I., 36. *Sacc. Syll.* 7092.

Stereum aquilum, *Fries in Herb. Berk.*

Mexico.

Specimen from Fries himself, but with no indication where described.

Stereum rubro-pallens (*Schw.*), *Thelephora rubro-pallens*, *Schwein. Amer. Bor.* 677.Spores elliptical, $6-7 \times 3 \mu$.**Stereum arenicolum**, *Berk. Mass. Mon.* 201.

On sand. Vera Cruz.

Stereum æquinoctiale, *Mont. in Herb. Berk.*

Guiana.

Specimen from Montagne, without reference to diagnosis.

Stereum spongiosum, *Mass. Mon.* 172. *Thelephora Micheneri*, *B.*, in part.**Stereum sulfureum**, *Fries Fungi, Mex.* *Stereum citrinum*, *Berk. & Rav. in Rav. Fungi Car.* III., 28.

Cuba, Ceylon, Mexico, Georgia, S. Carolina, Nicaragua, S. Australia.

AUSTRALIAN FUNGI.

BY M. C. COOKE.

*(Continued from p. 7.)***Corticium sulphurellum**, *Cke. & Mass.*Broadly effused, usually forming a very thin pulverulent bright sulphur-yellow stratum, when perfectly evolved the hymenium is waxy and polished. Spores obliquely pip-shaped, $7 \times 4 \mu$.On bark of dead branches. Oakleigh, Victoria. (*Martin*, 925.)**Secotium scabrosum**, *Cke. & Mass.*Peridium hemispherical, depressed, dingy olive or greyish, minutely scabrid. Gleba lacunose, septa gill-like, waved and folded, dark reddish-brown. Spores lemon-shaped, rather coarsely warted, pale olive-yellow, $16-18 \times 10 \mu$. Stem very short, almost obsolete.On the ground. Domain, Melbourne. (*Baron Mueller.*)**Diploderma melasperma**, *Cke. & Mass.*Subglobose, about one inch in diameter. Exoperidium thin, persistent, densely velvety, grey. Endoperidium thin, smooth, cinnamon. Nucleus small; mass of spores blackish-umber; capillitium dense. Spores globose, very minutely warted, 4μ .On ground. Port Phillip. (*Baron Mueller.*)**Bovista hypogea**, *Cke. & Mass.*

Subterranean. Globoso-depressed (about one inch), outer cortex persistent, thin, white, silky; inner layer thin, whitish,

flexible, dehiscing by a very minute determinate pore at the apex; mass of spores bright yellow-olive. Capillitium very dense. Spores globose, warted, 6-7 μ diameter.

Subterranean or partly exposed. Adhering so firmly to the soil as to be with difficulty removed.

On the ground. Gipps Land. (*Martin*, 934.)

Polysaccum album, *Cke. & Mass.*

Peridium globose, 5-6 c.m. diameter, white, polished and shining, attenuated below into a very short, stout, irregular, stem-like base. Peridiola irregularly polyhedral, 2-3 m.m. across. Spores in the mass yellowish-olive, globose, rather coarsely warted, 9-10 μ diameter.

On the ground. Dundoo, Queensland. (*Martin*, 916.) Victoria.

Zignoella (Zignaria) erumpens, *Cooke.*

Scattered, or aggregate, erumpent, and then nearly superficial, or semi-immersed. Perithecia globose, smooth, black ($\frac{1}{3}$ m.m. diam.), slightly papillate. Asci cylindrically clavate, octosporous. Sporidia fusoid-elliptic, uniseptate, slightly constricted, binucleate (15-16 \times 4-5 μ), hyaline.

On twigs. Victoria. (*Martin*, 948.)

Coniothyrium septorioides, *Cke. & Mass.*

Epiphyllous. Spots orbicular, tawny, with a broad purple margin. Perithecia mostly in circles upon the spots, sometimes scattered, black, erumpent, globose, membranaceous. Sporules broadly elliptical, continuous, pale brown, 5-6 \times 3-4 μ .

On leaves of *Prostanthera lasiantha*. Grampians, Victoria. (*Baron Mueller*.)

Diplodia canthifolia, *Cke. & Mass.*

Epiphyllous. Perithecia scattered, immersed, membranaceous, dark brown, piercing the cuticle. Sporules elliptical, for a long time continuous, then elongated and uniseptate, slightly constricted, brown (8 \times 5 then 12 \times 5 μ).

On leaves of *Canthium latifolium*. Tempe Downs. (*Mueller*.)

Coryneum viminalis, *Cke. & Mass.*

Pustules punctiform, flattened, scattered, black; not seated on definite spots. Conidia obovate or pyriform, 1-2 septate, not constricted (8-10 \times 5-6 μ), pale purple-brown, on rather long filiform sporophores.

On leaves of *Eucalyptus viminalis*. Victoria. (*Reader*.)

Stilbum caninum, *Cke. & Mass.*

Gregarious, clavate or subspatulate, flesh-coloured (2-3 in. high), capitulum darker, continuous with the smooth stem. Conidia ellipsoid, continuous, hyaline, 5 \times 3 μ .

On dog's dung. Victoria. (*Martin*, 944.)

Stem sometimes furcate. Larger, and more robust than *S. fimetarium*, with smaller conidia.

NEW BRITISH FUNGI.

BY M. C. COOKE.

(Continued from p. 25.)

Agaricus (Amanita) aridus, *Fr. Hym. Eur.* 25. *Fr. Icon. t.* 12, *f.* 2.
Sacc. Syll. 40.

Pileus flattened, thin, obtuse, grey, naked (6-7 c.m. broad), margin sulcate, flesh white; stem stuffed, then hollow at the apex, attenuated upwards, nearly equal, almost smooth (8-10 c.m. long), ring distant; gills attenuated, adnate.

On the ground. Dunstable. (*W. G. Smith.*)

Agaricus (Lepiota) nympharum, *Kalch. Hung. t.* 2, *f.* 1. *Fr. Hym. Eur.* 33. *Sacc. Syll.* 122.

Pileus fleshy, convex, then expanded, umbonate, torn into concentric scales, wholly white, or with a brownish disc (5-8 c.m. broad); stem hollow, equal, smooth (swollen at the base), floccosely mealy above the distant ring (8 c.m. long, 1 c.m. thick); gills attenuated behind, free, white.

On the ground. Warwickshire. (*Mrs. Russell, fide W. G. Smith.*)

Agaricus (Leptonia) anatinus, *Lasch. No.* 561. *Fr. Hym. Eur.* 201. *Sacc. Syll.* 2921.

Pileus rather fleshy, campanulate, with a darker umbo, longitudinally fibrillose and squamulose, greyish brown (1-2 in. diam.). Stem somewhat hollow, becoming blue (especially at the apex), at first pruinose, then scaly-fibrillose, even at the apex (not punctate with black); gills adnexed, seceding, broad, whitish, then flesh-colour. Spores oblong, $10 \times 7 \mu$.

Under oaks. Near Alresford, Hants.

Cortinarius (Inoloma) argutus, *Fries Hym. Eur.* 359. *Sacc. Syll.* 3785.

Pileus compact, conical, then flattened, rather gibbous, silky-fibrillose, ochraceous (8-10 c.m. broad); stem solid, ventricose, fibrously scaly, white, then yellowish, base distinctly rooting (8 c.m. long, 2 c.m. thick); gills adnate, rather distant, white, then clay-coloured. Spores $14-16 \times 9 \mu$.

On the ground. Alresford, Hants.

Porothelium Friesii, *Mont.*

The only British specimen in *Herb. Berk.* is evidently *not* that species, but *Corticium porosum*, B. & C., from Wothorpe. Hence the species cannot be retained as British unless another locality for it can be authenticated.

Clavaria rufescens, *Schæff. Icon. t.* 288. *Fr. Hym. Eur.* 670.

Trunk thick, elastic, tan-coloured, very much branched, branches multifid, crowded, somewhat fastigiate, even, tan-colour, with red tips.

On the ground. New Forest.

Clavaria fuliginea, *Pers. Myc. Eur.* 1., 166.

Gregarious, cinereous, becoming rufescent (2-3 in. high, 2 in. broad), very much branched; stem thin, larger branches thick, compressed; lateral rather incomplete; branchlets somewhat fastigiate, short, acute. Spores globose ($10\ \mu$), with an apiculus, ochraceous.

On the ground. Burnham Beeches.

Helotium deparculum, *Karst. Myc. Fenn.* 150. *Buck. Brist. Fung.* XIII.

Gregarious, at first sphaeroid, then nearly plane, when dry hemispherical and concave, sessile, mealy-puberulous, pallid, or pallid yellow, when dry ochraceous or reddish yellow ($0.03\text{--}0.04\text{ m.m.}$ broad). Asci cylindrically clavate, 4-spored ($30\text{--}45 \times 4\text{--}5\ \mu$); spores linear-fusoid, straight or slightly curved, simple or pseudo-septate ($12\text{--}15 \times 1\frac{1}{2}\ \mu$), paraphyses few, slender.

On dead stems of *Spiraea ulmaria*. Ashton.

Lachnella fragariastris, *Phillips in litt. Buck. Brist. Fung.* XIII.

Gregarious; stipitate, firm, cyathiform, faint purplish red, paler near the margin, clothed with short, hyaline, simple hairs, usually enlarged at the summit; asci subclavate; sporidia fusiform or oblong-fusiform ($5 \times 1\text{--}2\ \mu$); paraphyses acerose, rather stout, somewhat abruptly acuminate.

On dead strawberry stems. Clevedon.

Oligonema furcatum, *Buck. Fungi Bristol p.* XIII.

Sporangia scattered, globose, shining, bright chrome yellow, as well as capillitium and spores; elaters cylindrical, simple, or branched, slightly thickened at the obtuse ends, with a faint open spiral ($3\text{--}4\ \mu$ diam.); spores globose, minutely warted ($11 \times 12\ \mu$ diam.).

On rotten trunk. Near Bristol.

Perichæna confusa, *Massee in litt. Buck. Bristol Fungi* XIII. *Ophiostroma umbrina*, *Ellis N. A. F.* 726. *Perichæna variabilis*, *Rostk. Physarum vermiculare*, *Schwein.*

Sporangia hemispherical and scattered, or æthalioid, and often forming an irregular network, pale umber or dingy ochraceous, dehiscing irregularly; capillitium well developed, forming an irregular loose network, threads (2-4 thick) irregularly notched; spores subglobose ($13\text{--}14\ \mu$ diam.), smooth; mass of capillitium and spores dingy ochraceous, sometimes with a suggestion of olive.

On wood. Yatton.

Sporotrichum læticolor, *Cke. & Mass.*

Effused, when mature forming a loose, pulverulent, bright golden-yellow stratum; hyphæ procumbent, variously branched, septate, $3\text{--}4\ \mu$ diameter; spores elliptic-fusiform, smooth, base truncate, very copious, produced singly on short lateral branchlets, $8 \times 4\ \mu$.

On bark. Halifax. (*Crossland.*)

SACCARDO SYLLOGE FUNGORUM.

The ninth volume of this work has been issued, and contains the first portion of an Universal Supplement, from Agaricaceæ to Laboulbeniaceæ; and the tenth volume containing the remaining portion is promised in 1892. This latter part is also to include a Bibliography, a repertorium of species according to their hosts, an alphabetical Index of species, and an alphabetical Index to the families, genera, and sub-genera in the entire work.

The present volume of 1,140 pages gives the diagnoses of about 4,500 additional species of Hymenomycetes, of Gasteromycetes, of Hypodermæ, of Phycomycetes, and of Pyrenomycetes, including the new species published during the progress of the work, and supplying many of the omissions in the previous volumes. The task has been a herculean one, and perfection was hardly possible, where such an immense mass of scattered literature had to be consulted; but this supplement will do much towards rendering the work complete. Of course the volumes will be indispensable to every public library, as well as every private library of scientific pretensions, and although costly, will supply the place of an immense bulk of periodical publications, and, in the end, prove a saving of money, as well as of space, to the specialist, both of which advantages are not to be despised.

MEMORABILIA.

GEASTER HYGROMETRICUS.—Mr. Percy Grimshaw has found three or four old specimens of this *Geaster* in Yorkshire.

CORDYCEPS SHERRINGII, *Massee*.—By error this species was called *Speeringii* in "Grevillea," p. 15, whereas it should have been as above.

HYPOCRELLA TUBERIFORMIS (B. & R.), *Cooke*.—The species called *Hypocrea tuberiformis*, B. & Rav., see *Sacc. Syll.* II., 4902, was assumed by Patouillard to be identical with his *Dussiella tuberiformis* (B. and R.), Pat., see *Sacc. Syll.* IX., 4021, but this is called in question by G. F. Atkinson, in "Botanical Gazette," October, 1891, where he states that they are *not* identical, and that *Hypocrea tuberiformis*, B. & Rav., should be called *Hypocrella tuberiformis*, as stated by ourselves, years ago, in "Grevillea," Vol. XII., p. 105, No. 161.

INDEX TO COOKE'S ILLUSTRATIONS.—A few copies are left of a special Index to the plates in this work, in alphabetical order, giving the MS. numbers to the plates, according to the systematic arrangement adopted in the several Indices to the volumes, thus enabling any plate to be found at once, when bound in systematic order. The price is one shilling each, direct.

AGARICUS (PANÆOLUS) FIMIPUTRIS.—We have just discovered that in "Illustrations of British Fungi" the names on two of the plates have been transposed by misadventure.

Plate 625 should be *Ag. phalenarum* with the appendiculate veil, and

Plate 626 should be *Ag. fimiputris* with the annular zone on the stem.

Subscribers and purchasers will please note the correction.

FUNGUS FORAYS IN 1891.

On all hands we have received intimation that the fleshy fungi have been more plentiful this year than for three or four seasons past; indeed, they could not well have been worse than in 1889 and 1890. Doubt and uncertainty prevailed so late into the year that the enthusiasm for Fungus Forays cooled down, and the most celebrated and ancient of all Fungus Forays, that of the week with the Woolhope Club at Hereford, was represented by a single day. The customary *two* days of the Essex Field Club diminished to *one*, which latter had to be abandoned, on account of the death of the proprietor of the property on which the hunt was to have taken place. The Hampshire Society only arranged for a half-day trip, but that proved to be a successful and enjoyable one, as the weather was fine. The Hackney Society held no Fungus meeting, but the Hertfordshire Society held their usual Saturday, which proved a success as far as regards the fungi. The Cryptogamic Society of Scotland was undaunted, and kept the "even tenor of its way," but, on the whole, it will be seen that Forays were not in the ascendant.

We have heard of no extraordinary appearances and no remarkable new species, except those recorded in another page of this Journal as new to Britain. Mr. Massee has reported that *Tremellodon gelatinosum* was so plentiful in the New Forest that it might have been collected by the hundredweight, and yet we had always considered this rather a rare species with us. A singular incident occurred in September, when a large cluster of *Agaricus (Psalliota) Elvensis* came up under a pear tree in our own garden, so that for a week or more our table was continuously supplied. It is one of the best of edible species, and some of the specimens had a pileus of six inches in diameter. How, and why, did it select our garden? We had only known of it at Neasden, miles away, in previous years, whence we had many a delicious morsel. The only probability we can think of is that old specimens, showing trace of maggots, had been cast away two or three years ago, and that, in course of time, the spores germinated. It is a habit with us to fling all fungus *débris* into the garden, so as to give them a chance if so disposed. If the present species is liable to propagate itself in that manner it will be a valuable species for domestic purposes. We shall be curious to see if it continues to flourish in the same spot another year.

HANDBOOK OF AUSTRALIAN FUNGI.

We are able to announce that at length arrangements have been made with the several governments of Australia for the publication of a Handbook of Australian Fungi, by M. C. Cooke, in one octavo volume, with coloured and plain plates, illustrating all the principal genera and subgenera, with the descriptions of the genera and species in English. It is anticipated that this work will be printed in a few months, having been already commenced. The material consists of the species published by Kalchbrenner in this Journal, the majority of which passed through the author's hands at the time; the species described by Berkeley and Broome, which again had been communicated, by one or other of the last named, at the time of publication, and a vast number of specimens, amounting to some thousands, which were from time to time communicated by Baron F. von Mueller, F. M. Bailey, Mrs. Flora Martin, F. Readey, Dr. Berggren, and others in Australia. Besides the copies which will be despatched to the Colonies, a few will remain for sale in Europe at about forty shillings each. The plates will, as far as possible, represent Australian species, most of the fleshy kinds being transcripts of water-colour sketches made on the spot, and these will be executed in chromo-photography by the same hands as the plates of Cooke's Illustrations of British Fungi. It is confidently expected that the entire work will be ready for publication about Midsummer, 1892, and will be issued under the sanction and authority of the Governments of New South Wales, Victoria, Queensland, South Australia, and Tasmania.

BRITISH EDIBLE FUNGI.*

For manifest reasons we cannot express any opinion on the book before us, although we may call attention to its contents. As no complete and satisfactory volume on British Edible Fungi has appeared since that by Dr. Badham, of which the first edition is dated 1847 and the second 1863, there need be no apology for filling up a vacancy. Attempts have been made in the interim, but, without being invidious, we may describe them as disappointing. For some years our mycological friends have pressed us to issue such a book as the present, but the pressure did not avail until we had seen the last plate of our "Illustrations," and then we yielded, but with what success it is not our province to judge. The twelve coloured plates include figures of about 45 species, and the letter press of 240 pages is printed in clear and legible type, so that, even as books go, it is a cheap volume for three half-crowns. In all there are thirty-five chapters, and what is neces-

* "British Edible Fungi, how to distinguish, and how to cook them," with coloured figures of upwards of forty species, by M. C. Cooke. One Vol., 8vo, cloth. Kegan, Paul, Trench, Trubner, and Co.

sary to say about them may be gathered from the preface, which is to the following effect :—

“ Fungus eating is on the increase, thanks to Field Clubs and Fungus Forays, but the complaint has been heard for many years that no sufficient handbook for the guidance of young or inexperienced mycophagists could be found in the English language. One or two laudable attempts have been made, but they have left much to be desired, and for the past ten years my fungus-eating friends have continued to urge me, as one of the oldest fungus eaters, to give the results of my experience. Admirable as Dr. Badham’s book was when published, and fully as it answered its purpose then, no one will contend that it is ‘ up to date.’ However, the world is large enough for both of us. The list given at the end will represent all the kinds that I remember to have eaten, and as sixty-five will be considered sufficient to establish my claim to be a fungus eater, it may also be regarded as sufficient to exonerate me from any charge of presumption or inexperience. It has usually been the custom to include poisonous and edible fungi in one book, but from this custom I have diverged, for two or three reasons. It is not commendable to popularize knowledge of vegetable poisons easy to procure. It is not advisable to mix the descriptions and figures of good and bad species without distinct labelling, as on a chemist’s bottle, of ‘ poison ’ across each noxious species. And it is *not* desirable to increase the bulk and cost of a little book which was intended in furtherance of ‘ fungus eating.’ Copious notes have been added on the preparation of the different species for the table, some old and some new, but all practical. By the aid of the descriptions in writing, as untechnical as possible, and the coloured figures, it is hoped that all reasonable care has been taken to prevent error or danger in eating mushrooms or toadstools. If I have rendered the art of fungus eating easier or safer I shall have accomplished my object.

“ M. C. COOKE.”

AGARICUS GIGANTEUS AND A. MAXIMUS.

By M. C. COOKE.

We have heard recently that in some quarter or other an exception has been taken to the accuracy of our figures, under these names, in the “ Illustrations of British Fungi.” Doubtless it is always easy to doubt or deny, but not so easy to prove. According to our own judgment we were accurate in our determination, although not inclined to be positive that our judgment is superior to that of any one else with an approximate experience. In this determination the Rev. M. J. Berkeley expressed his acquiescence at the time. Hence the figures represent fairly what we both conceived to be the two species. Against this decision an adverse opinion has

now been expressed in the following words: "Dr. Cooke has wrongly named them in his Illustrations (see Plate 135, where *A. giganteus* is figured under the name of *A. maximus*, and Plate 106, where *A. Paxillus* is figured under the name of *A. giganteus*."* Let us first dispose of the last sentence, anent a confusion of *A. Paxillus* with *A. giganteus*. Referring to 'Fries Hymenomyces Europæi,' p. 224, we discover that the only Agaric therein called *Agaricus Paxillus* is a species of *Pholiota*, of a wholly cinnamon colour, with cinnamon spores, belonging therefore to the series *Dermini*, whereas the figure of *A. giganteus* is not cinnamon, has no ring, as *A. Paxillus* should have, but on the contrary is yellowish white, and leucosporous, or with nearly colourless spores. Perhaps, however, in assuming to correct one error another has been made, and that instead of writing *A. Paxillus* as a contraction of *Agaricus Paxillus* it should have been, 'a species of *Paxillus* is figured under the name of *A. giganteus*,' and, if so, it may be assumed that the writer intended *Paxillus giganteus* (Sow.) according to Fries Hym. Eur., p. 401. Thus stated it would have amounted to this, 'on Plate 106 *Paxillus giganteus* is figured as *Agaricus giganteus*.' And here we are ready to admit that the *Paxillus giganteus* of Fries Hym. Eur., p. 401, is possibly the same as the *Agaricus giganteus* of Fries' 'Epicrisis,' p. 67, although not cited by Fries as a synonym. Sowerby's figure 244 is quoted, however, under both names." Our sole error, then, appears to be that we have followed Fries in his "Epicrisis" in retaining *Agaricus giganteus* under the genus *Agaricus*, instead of accepting his more recent transposition to the genus *Paxillus* (Fries Hym. Eur., p. 401). We do not care to go all over the question as to whether the *Agaricus giganteus* of Sowerby is a true Agaric, or a species of *Paxillus*, or how *Agaricus giganteus* and *Agaricus maximus* are confused in the "Handbook," but will take the two species as they stand—*Agaricus giganteus*, Fries Epicrisis, p. 67, and *Agaricus maximus*, Fries Hym. Eur., p. 401—leaving out of the question, for the present, Sowerby's fig. 244.

Agaricus (Clitocybe) giganteus, Fries Epic. p. 67. Mon. I., 118.
Paxillus giganteus, Fr. Hym. Eur. 401. Letell. t. 682. Steer.
 Swam. 86. Sow. t. 244 (?).

Broad, rather caespitose, wholly tan-white. Pileus at first depressed, then broadly or flatly infundibuliform, thin, but equally fleshy, soft, not flaccid, but easily splitting from the margin towards the centre, as much as a foot broad, often excentric, and for the most part sinuately lobed, when fresh moist and adglutinately villous, when dry delicately flocculose, and cracked into scales. Margin at first involute, pubescent; soon spreading, smooth, and at length revolute, sulcately channelled, or radiately rugose. Stem solid,

* In an advance proof of a review sent to the publishers of "Edible Fungi."

compact, and hard without and within, $2\frac{1}{2}$ in. long, 1-2 in. thick, equal, even, smooth. Gills a little decurrent, numerous, crowded, 3 lines broad (two or three times as broad as the flesh of the pileus), connected by veins, thin, fragile, whitish, then yellowish or rufescent, soon mealy with the white spores.

In grassy places.

This is distinguished by its robust form, resembling *Lactarius vellereus*, short, thick stem, shallow saucer-shaped pileus, sometimes margin sulcate; gills a little decurrent, 3 lines or more broad, thin and splitting, mealy; often very gregarious.

Berkeley's description of this species is not literally the same as that given by Fries; it was published under 987 in *Annals of Nat. Hist.*, 1865, and employed in preference for the British form, in Cooke's "Handbook" (2nd edition), No. 161, as follows:—

"Pileus infundibuliform, not umbonate, slightly flocculose, white, opaque; stem equal, thick; gills white, then yellowish, shortly decurrent."

He also states that "the pileus is slightly viscid when moist, 9 in. across, with a stem $2\frac{1}{2}$ in. high, 1 in. thick;" but he does not think it represented by Sowerby's figure. Afterwards he held it to be represented by "Illustrations," Pl. 106, which may be accepted as the *Ag. giganteus* of Berkeley, but whether of Fries or of Sowerby may be left an open question. The description in Berkeley's "Outlines," p. 110, is dated 1860, and therefore prior to his description given independently in 1865.

Agaricus (Clitocybe) maximus. *Fr. Epic.* p. 67. *Mon.* i., 119. *Hym. Eur.* 93. *Buxb. c.* iv., t. 1.

Pileus fleshy, disc compact, otherwise thin, rather flaccid (not splitting), broadly infundibuliform, umbo-central gibbous (to a foot broad); always very dry, surface silky, smooth, or squamulose, tan, growing pale or whitish. Margin involute, pubescent, always even; flesh white, at length soft. Stem solid, compact, but spongy within, elastic, 4 in. long, 1 in. thick, attenuated upwards, fibrillose, striate, whitish. Gills deeply decurrent, attenuated to each end, rather crowded, soft, simple, whitish, not changing. Odour faint, pleasant.

In shady woods, amongst leaves.

A large species with a deeply funnel-shaped pileus, flesh thin and flaccid, except at the disc; gills narrow, gradually attenuated to each end, deeply decurrent behind. Stem long, from 4 to 8 in.; spongy within, striate with fibrils externally.

Berkeley (*Annals Nat. Hist.*, No. 987) refers Sowerby's Plate 244 to this species, whilst Fries (*Hym. Eur.*, 401) refers it to his *Paxillus giganteus*. Hence it can hardly be considered typical of either.

The description given under the name of *Agaricus giganteus*, Sow., in *English Flora*, p. 33, is supposed to be represented by

Sowerby's figure, and to include the *Ag. infundibuliformis*, var. *maximus*, of Fries Elenchus, p. 13. It only needs a reference to the literature of the subject to discover that the two names *giganteus* and *maximus* are intricately mixed up, at least, prior to 1865, and we must take leave to doubt whether the long explanatory note given by Stevenson (Vol. II., p. 66) under *Paxillus giganteus*, can be wholly applicable to that species, and not indiscriminately to both, for the quotation is from Berkeley, and was written in 1836, or nearly thirty years before he had recognized a distinction between *Ag. maximus* and *Ag. giganteus*.

Buxbaum's figure (Cent iv., Pl. 1), the only one quoted by Fries under *Ag. maximus*, although rough, represents the habit of *Ag. maximus* as we have interpreted it in "Illustrations," Plate 135, on a considerably reduced scale.

MASSEE ON MUCORS.*

As a natural consequence of the rapid increase in the number of genera and species of the British Fungi it has become necessary to prepare and issue "Handbooks" for various smaller groups, instead of, as of old, attempting works which would include the whole range of British Fungi. What such an universal handbook would have to be *now* it is almost fearful to contemplate, certainly the cost would be beyond the means of the ordinary student, and, as no publishers would undertake it, the author would have to be the victim of his own zeal. Besides this, students themselves shrink from any attempt to grasp the whole subject, contenting themselves with small and well defined groups, within their power of investigation. To such persons large and cumbersome books would be a nuisance, including, as they must do, a very large proportion in which they have no abiding interest. No apology, therefore, is needed for the production of such volumes as Phillips' "Discomycetes of Britain," Plowright's "British Uredineæ," Grove's "British Schizomycetes," Cooke's "Myxomycetes of Great Britain," and now of Massee's "Phycomycetes and Ustilagineæ."

The latter work is introduced by a short preface which declares that "the object of the present book is to bring up to date the British species of Fungi included in the divisions known as the *Phycomycetes* and the *Ustilagineæ*. Many species, and even genera, belonging to the first named division are new to our flora, and careful search will undoubtedly reveal more new forms. The great interest in connection with such fungi, however, is not so much the discovery of new species as a careful investigation into the life-history of forms already known. When this is done, and not before, it will be possible to speak of genera and species from a

* "British Fungi, Phycomycetes and Ustilagineæ," by George Massee. Eight plates. L. Reeve and Co.

fairly safe standpoint. The introductory part of the present volume will give the reader an idea of the amount of investigation yet necessary as proved by the directly opposed views of the best workers on subjects that are of primary importance."

The volume contains chapters on Morphology, Geographical Distribution, Lichen-forming Fungi, Myxogasters, Schizomycetes, Collection and Preservation of Fungi, Examination of Fungi, Classification, and Fossil Fungi. It is not evident from this synopsis that the book treats, really, of three groups of fungi, somewhat related, or analogous to each other, but belonging, as the table shows, to the *Zygomycetes*, the *Oomycetes*, and the *Phycomycetes*. That is to say, there are the true Mucors, or the old *Phycomycetes*, and with them the *Peronosporæ*, and allies, formerly included with the *Mucedines*; and finally the *Ustilagineæ*, more commonly associated with the *Uredinæ*. The reason for this association is rather obscure, especially as regards the last group.

The general introduction will be read with much interest, and it occupies nearly half the volume, the residue, containing descriptions, being the practical, or working, portion for the determination of species. Such information as that contained in the introduction will be especially welcome to students, as it is written in a popular style, and will commend itself also to those who are only in search of general information, without any intention of sitting down to a practical study of the subject. Accustomed to teaching, with a fund of experience, the author is here to be seen at his best, but we cannot say that we admire the execution of the plates. The figures are hard and wooden, in many cases, and often heavy and ugly. They will not compete with those we are in the habit of seeing in foreign works, such as those of Brefeld for example, and do not say much for English pictorial art as applied to scientific subjects.

It is hardly necessary to state that we are not fully in accord with the writer in all his conclusions and opinions. Here and there we meet with such opinions, but as they are mostly on matters of secondary importance, and even sometimes qualified in their expression, we see no occasion to parade them. Taking the book as a whole, we are prepared to extend to it our unqualified recommendation, and to coincide in the hope expressed in the last paragraph of the preface "that other volumes dealing with the remainder of the fungi will not long be delayed." As Mr. Massee is a persevering and industrious worker, it will hardly be *his* fault if such a consummation be not attained.

In order to convey some idea of the style and matter of the introduction we will transcribe a few paragraphs by way of specimen: "From a broad point of view the characters that separate plants from animals are (1) permanent cell-walls composed of cellulose, at least when young; (2) the presence of chlorophyll, which enables plants to feed on inorganic food. It is well known that certain plants belonging to widely separated natural orders have

degenerated so far from the ancestral stock as to have lost the power of forming chlorophyll, and in consequence, like the fungi, have become parasites, or saprophytes; the bird's nest orchis, *Neottia nidus-avis*, and toothwort, *Lathræa squamaria*, are examples, but in most cases these degenerate species still retain the same general structure, so that there is but little difficulty in consigning them to their proper order, although in some instances these phanerogamic departures from the typical stock have become so modified as to present but slight affinities with any of the normal groups, the fungi, in like manner, appear to have descended from chlorophyll-producing ancestors, but such ancestors were very much lower down, or nearer the starting point of plant life, than flowering plants, and are represented at the present day by the simple green algæ, furnished with sexual organs, illustrated by such genera as *Vaucheria*. The *Saprolegniæ*, mostly aquatic fungi, and the *Peronosporæ*, inhabiting the tissues of living plants, may be considered as illustrations of forms near the starting point of the fungi proper, and omitting for the moment the presence of chlorophyll in the one case, and its absence in the other, the above-mentioned algal and fungal forms present many important morphological features in common. In both there is the same long, irregularly-branched vegetative portion, in both the tips or interstitial portions become swollen into a more or less globose receptacle or *oogonium*, the female organ of reproduction, into which the protoplasm becomes aggregated and retained by the formation of septa across the tube. This oosphere is fertilized by a small organ or *antheridium* produced in close proximity to the oogonium, or on a distinct branch, depending on the particular species. It is very important to bear in mind that the above account is not intended to convey the idea that fungi actually originated from the algal genus *Vaucheria* and allied forms, but simply to show that at the points indicated the homologies between algæ and fungi are very pronounced.

"In the degenerate forms of flowering plants, already mentioned, we find several distinct starting points, as in *Orchidaceæ*, *Scrophulariaceæ*, *Balanophoræ*, etc., and although agreeing in the common feature of having the power of developing chlorophyll arrested, yet these starting points of new plant ideas must have been separated by long intervals of time, inasmuch as the aberrant members of the two first-mentioned orders would still be typical members of their respective orders, if furnished with chlorophyll, whereas, in the last order, the species have become so much modified that they are not in close touch with any order of chlorophyll-bearing plants, a fact implying a long period of time since they broke away from their normal ancestors, because it must be remembered that there is no evidence in favour of the idea that plants without chlorophyll originated as such, whereas the evidence in favour of the idea that all plants without chlorophyll have descended from chlorophyll-producing ancestors is very strong.

"Judging from the case of fungi, there is no reason why the side issues of flowering plants, characterized by absence of chlorophyll, should not become so thoroughly differentiated from the parent stock as to constitute a distinct group, phanerogamic fungi.

"In like manner, it is not necessary to assume only one point of departure for the fungi from the algæ, but the close agreement between the *Saprolegniæ* and certain algæ indicates the origin of the fungi, and shows also that between the two examples given the point of divergence is not wide. It is observable in almost every instance of a marked departure from a typical group, that the earliest departures remain stereotyped at a certain stage of development as a group, characterized by features partly their own and partly those of their arcestors; connecting links, in fact. Certain elastic members of this first group in turn develop new features, and where the new departure is able to hold its ground in the struggle for existence, this process of evolving new morphological and physiological factors, a process generally contemporaneous with the obliteration of the original characteristics of the stock from which the new type originated, is repeated, until eventually a group of organisms is produced possessing strongly marked features in common, and only in touch with the group from which it evolved in the possession of those characters common to all plants.

"In illustration of the above, it may be mentioned that in those sections of fungi, of which the mushroom and puff-ball are characteristic, there is not the remotest indication, morphologically or physiologically, not even in the earliest phase of development, of any affinity with the algæ, and it is only by means of tracing the origin of these terminal groups of fungi from others lower in the scale of fungal differentiation that their true origin and sequence can be determined. From what has been said respecting the evolution of the fungi from the algæ, and also of the sequence from the most highly differentiated to the primitive group of fungi, there is the danger on the part of the reader of assuming that the origin and sequence of development of the fungi is fairly complete. To guard against any misconception it is important to state clearly that such is not the case; it is generally admitted that the fungi are of algal origin. and, further, that the main divisions of fungi are connected with each to such an extent that the idea of independent starting points is not suggested; but it must be remembered that each of the main sections in which fungi are naturally divided is composed of several smaller sections, and the sequence of origin and affinity between these minor sections are yet far from being settled. We may conclude this portion of the subject by stating that the most fascinating branch of biology—embodied in the term (life-history)—can alone indicate the required evidence for a satisfactory solution of the affinities between the various sections."

The volume is neatly printed, and there is an index of terms, an index of plant and animal hosts, and a systematic index at the end.—M.C.C.

RUSSULA REDIVIVA.

Russula is in the opinion of all mycologists one of the most puzzling, for the discrimination of species, in the whole range of the Agaricini. The short descriptions given in Manuals and Epierises are barely sufficient in the most facile of genera and subgenera, but here something more seems to be necessary, and we have long desired to collect together the various independent descriptions, and all the illustrative notes which could be found, which would aid in the elucidation of a difficult subject. The best way to achieve such an object is by no means clear, nevertheless, some experimental course might be adopted, and the publication of one or two examples would perhaps serve to suggest how something more complete could be done. With this view we have selected the following species as a commencement, and leave them to be their own comment.

Russula (Rigidæ) lactea. *Pers. Syn.* 439. *Fries Epic.* 355. *Hym. Eur.* 443. *Fr. Mon. p.* 190. *Quelet Jura* 182. *B. & Br., Ann. N. H.* 1133. *Stevenson B. F. II.,* 118. *Cooke Hdbk. II., No.* 1199. *Cooke Illus. t.* 1070. *Gillet Champ.* 234. *Sacc. Syll.* 1809. *Agaricus lacteus, Krombh. t.* 61, *f.* 1-2. *Paulet Champ. t.* 74, *f.* 2.

Mild, milk white; pileus fleshy, compact, unpolished, then rivulose; margin straight, thin, obtuse, even; stem solid, compact, obtuse; gills free, thick, distant, rigid, rather forked.

On the ground under beech. Rare.

Stem spongy in the centre, although very hard, as much as $1\frac{1}{2}$ in. thick. Pileus at first white, campanulate, dry, then tan-coloured, white, rimulose, convex then depressed, and often excentric. Gills at length adnate, rather crowded, very broad, furcate at the base and apex. Edible.—*Hym. Eur.* 443.

Persoon's original description was, as usual, extremely short:—"Pileus rather depressed, white; margin even; gills watery, pallid." In beech woods. "Pileus 3 in. broad; gills rather thick, often connected with veins; stem longer than in the former." (*Ag. niveus*).

When recording this for the first time as a British species Berkeley wrote: "The thick distant gills and milk-white pileus characterize this fine species, which is probably widely diffused."

Stem solid, compact, at length spongy-soft within, $1\frac{1}{2}$ -2 in. long, $1\frac{1}{2}$ in. thick, equal, even, always white. Pileus compact, and everywhere fleshy, campanulate, then convex, often excentric, 2 in. diam., without pellicle, always dry, at first white, even, then tan-coloured white, rimulose when dry, spreading, even, obtuse; flesh compact, white; gills free, very broad, thick, distant, rigid, furcate, white. Allied to *R. rubra*. The figures of Krombholz correspond to specimens collected, which were smaller, less compact; pileus convex, then expanded, at length rather depressed; gills simple. This must not be confounded with decoloured forms of other species,

such as *R. nivea* (which is *R. fragilis*), *R. depallens*, etc.—*Fr. Mon.* II., 190.

Krombholz describes it thus :—" Usually solitary ; pileus always depressed, white or whitish, compact, fleshy, smooth ; margin straight, thin, rather obtuse, even ; gills broad, distant, thick, rigid, quite entire, white, simple, rarely forked ; stem rather long, compact, solid, rather thick, smooth, white, a little attenuated above and below ; flesh firm, taste mild, odour none."—*Krombh.* VIII., 23.

The figures of Barla (t. 15, f. 11-13), quoted by Fries under this species, are referred by Quelet to the supposed species which he names *R. incarnata*, but which we consider as only a variety of the above.

var. **incarnata** (*Quel.*). *Cooke Hdbk.* II., 1199. *Cooke Illus. t.* 1071. *Russula incarnata*, *Quel. Ass. Fr.* 1882, p. 10. *Sacc. Syll.* 1881. *R. lactea*, *Barla t.* 15, f. 11-13.

Pileus convex, then depressed (6.9 c.m. wide), mealy, then areolate, white, tinged with rose, at length tan-coloured, growing pallid ; flesh granular, white, sweet, sapid ; stem stuffed, firm, pruinose, snowy-white ; gills adnate, broad, bifurcate, rigid, yellowish-white ; spores elliptically spherical, 9 μ , aculeolate, hyaline, then lemon-yellow.—*Quelet.*

Under firs.

Barla's description in the text, is literally the same as that of Krombholz for *R. lactea*, quoted above.

var. **livida**. *Bresadola Hedwigia* 1885, p. 10.

Pileus fleshy, soon depressed in the centre, flattened, then infundibuliform ($3\frac{1}{2}$ -7 c.m. diam.) ; margin even, very light smoke colour, whitish when old, sometimes yellowish ; gills rounded behind, or obtusely acuminate (2-4 m.m. broad), acuminately adnexed, white, becoming yellowish, at first somewhat crowded, in old age distant ; stem stuffed, subcylindrical (2-3 $\frac{1}{2}$ c.m. long, 7-10 m.m. thick), white ; flesh dense, white ; taste mild, or scarcely acid ; spores white, rather yellowish, globose, very minutely echinulate (4-5 μ diam.).—*Bresadola.*

In woods.

Russula (Rigidæ) virescens (*Schæff.*). *Fries Epic. p.* 355. *Fr. Hym. Eur.* 443. *Mon.* II., 191. *Berk. Outl., t.* 13, f. 6. *Cooke Hdbk.* I., No. 622, II., No. 1200. *Stevenson B. F.* II., 119. *Gillet Champ.* 234. *Cooke Illus.* 1039. *Sacc. Syll.* 1810. *Agaricus virescens*, *Schæff. Icon. t.* 94 (not fig. 1). *Hussey II., pl.* XI. *Vittadini t.* 31. *Barla t.* 16, f. 10-12. *Venturi t.* 17, f. 1-2. *Sturm. Fl.* III., t. 31. *Eng. Fl. v.* 23. *Badham, p.* 101. *Russula æruginosa*, *Krombh. t.* 67, f. 1-10. *Pers. Obs.* 103.

Mild. Pileus fleshy, firm, globose, then expanded and umbilicate, innately flocculose, or areolate and warted ; margin straight, obtuse, even ; stem spongy or solid, stout, somewhat rivulose, whitish ; gills free, rather crowded, unequal and forked, whitish.

In birch woods, etc.

Pileus often unequal, always dry, cuticle falling away in areolæ.

Differs from the greenish species in the prior section (*Furcatæ*) in not being always green, but also verging on yellow.

Between *R. æruginosa*, Pers. Obs. 103, and *Ag. virescens*, Schæff., I discover no limit, nor between Secretan, 514, 516, 517. —*Fr. Hym. Eur.*

Pileus green, without pellicle, innately flocculose, then rivulose, areolately squamose, easily distinguished from all others. Taste mild, edible. Stem solid, spongy within, firm, white. Pileus compactly fleshy, globose, then expanded, at length depressed, often unequal, always dry, not pelliculose, cuticle flocculose, splitting up into areolæ or warts. Margin straight, obtuse, even. Size and colour variable, now deep, now pallid, and now green, becoming yellowish. Flesh white, less compact. Gills free, rather crowded, less yellowish in front than its allies, sometimes equal, sometimes furcate, mixed with a few shorter ones, white.—*Fr. Mon.* 191.

SPORES scarcely echinulate, $6\ \mu$ (W. G. S.), $8-10 \times 8\ \mu$ (Britz.), $6-7\ \mu$ (Bizz.), $6-7\ \mu$ or $8-9 \times 8\ \mu$ (Sacc.).

Pileus 4 in. broad, convex, at length slightly depressed and irregular, of various livid hues, yellow, purple, and green, fleshy, rugulose, very slightly viscid, margin even. The edge of the pileus sometimes hangs down in a singular manner. The texture is altogether vesiculose, consisting of roundish cells. Gills white, forked, sometimes anastomosing at the base, rather close, moderately rigid, elastic. Spores round, white. Stem 1-2 in. high, $\frac{1}{2}$ in. or more thick, obtuse at the base, various in form, slightly reticulated with raised lines. Taste and odour mild.—*Eng. Fl.* v., 23.

Pileus from two to four inches across, never viscid, fleshy, firm, at first globose, then umbilicate, expanded, much depressed in the centre in age, but the margin always remaining plane, obtuse; the cuticle is shining, thin, transparent, splitting at the margin, pallid, or variously shaded with ochraceous tints, covered with a thicker stratum, which is opaque, ceraceous, farinose, broken up at length into irregular warts of a dull verdigris or glaucous hue. Gills pure white, perfectly free, but in age appearing slightly decurrent from the depression of the pileus, unequal, rather distant, forked particularly at the junction with the stem, exceedingly crisp, firm, and brittle, varying greatly in breadth in different individuals, for the most part sublanceolate. Stem white, subrivulose, thick, nearly equal, hard, compact, not stuffed, but homogeneous, entirely composed of cells, softening in the centre with age. The flesh both of the stem and pileus is pure white.—*Hussey*.

The following are the forms described by Secretan, and cited by Fries :—

R. cogramulata. *Sec. No.* 514.

“Pileus in the centre bright orange, mixed with greyish, mealy, and dull. This tint is distributed at the sides in small labyrinthine compartments; the intervals which separate the granular spots are

white. Surface dry sounding in the hand. It is at first hemispherical, the margin folded in, the summit a little depressed, then plane, the centre always sunk, and more or less deformed; margin slightly depressed. Diam. $4\frac{1}{2}$ in. Flesh white, firm, brittle, 4 lines thick. Gills white, having about the margin of the pileus a yellowish lustre at the edge; they are numerous, slender, thick and veined at the base, $3\frac{1}{2}$ lines wide, slightly arcuate, bifid, branched, and much veined at the part which reaches the stem; short gills united entirely with their neighbours. Stem white, mealy, and with vein-like striæ near the gills, with a faint tinge of yellowish, or olive, at the foot. $2\frac{1}{4}$ in. long, 1 in. thick, swollen at the apex, conically attenuated and curved at the base. The foot is pointed. Flesh firm, hard; odour not disagreeable."—*Secretan*.

Under oaks.

R. heterophylla. *Secr. No. 516.*

Pileus the foundation is of a yellowish white, tessellated, labyrinthed more or less finely, the little compartments charged with green spots, forming verdigris blotches, powdered. These are more marked in the centre, and their colour more pronounced in youth. They extend in a network more crowded at the margin, producing there a simple granulation. Finally the pileus becomes yellowish, with a deeper tint in the centre, a little shining, striate at the margin. The form hemispherical, centre a little depressed, then convex, and at length concave. Diam. 5 in. Flesh white, firm, 4 lines thick.

Gills, in infancy, with a faint tint of flesh-colour, then they become white, they are numerous, fragile in old age, 3 lines wide, their greatest width is about the margin of the pileus. Nearly all bifid on arriving at the stem. Short gills in a small number.

Stem dull white, $2\frac{1}{2}$ -3 in. long, $1-1\frac{1}{4}$ in. thick, solid, straight or curved, sometimes conic and attenuated at the foot, sometimes swollen with deformities (bumps), the tint is reddish at the base. Odour indifferent.

Obs. It is difficult for me to admit with Persoon that this species is the same as Paulet, t. 95, f. 9, 10, 11.—*Secretan*.

R. virescens. *Secr. 517.*

var. A. Pileus in the first state the centre is verdigris powdery, the point in the middle darker, the green tint with a tinge of whiteness at the margin. Then the centre is mottled or yellow, turning to orange, the sides remaining of a verdigris green, more or less light. It is dry, dull, powdery, delicately like cloth, but without granulations. Later a darker tint, rather large, extends to the margin, the centre remaining of a light colour. In old age the surface is smooth, and the verdigris passes to yellowish green. It is some time plane, depressed in the centre, and finally the margin is elevated. Diam. $4\frac{1}{2}$ -5 in. Flesh white, not vinous under the

cuticle, firm, 5 lines thick. It descends irregularly into the gills.

Gills very white, numerous, firm, fragile, slender at the edge, often furcate, especially near the stem, sometimes anastomosing in the manner of cells. Their greatest width is 4-5 lines about the margin of the pileus, becoming narrowed on reaching the stem, where they are decurrent by a point.

Stem white, shining, $3\frac{1}{4}$ -4 in. long, 11-12 lines thick, full, straight or curved, a little swollen at the summit, of equal thickness in the lower part. Odour none.

var. B. Diam. $2\frac{3}{4}$ in. Stem $1\frac{3}{4}$ in. long, 7-8 lines thick. Gills bifid, prolonged after their union in a slender plate, rounded at the back. The points of these plates alternate, one convex and returning, the other prolonged and decurrent, the extremities of the plates are twisted and interlaced as a network.

Obs. Amongst other differences the very numerous gills separate this species from *A. furcatus*.—*Secretan*.

Russula (Rigidæ) lepida. *Fries Epic. p. 355. Hym. Eur. 444. Sverig. Svamp. t. 59. Mon. II., p. 191. Sacc. Syll. 1816. Berk. Outl. 212. Stevenson B. F. II., 119. Cooke Hdbk. I., 623, II., 1202. Cooke Illus. t. 1072-1073. Hogg & Johnst. t. 4. Huss. II., t. 32. Lambotte Belg. 322. Gill. Champ. 235. Agaricus rosaceus, Kromb. t. 64, f. 19-20. Ag. sanguineus, Batsch Elen. f. 13 (minor).*

Mild. Pileus fleshy, compact, convex, then depressed, unpolished, rather silky, or rimosely-squamose, growing pale, margin spreading, obtuse, without striæ; stem solid, compact, even, white or rosy; gills rounded, rather thick, somewhat crowded, many forked, white.

In beech woods.

Very much resembling the following (*R. rubra*), but truly different. Edible. Pileus rather equally fleshy, blood-red rosy, disc always turning whitish. Flesh firm, but cheesy, not granular (grumous). Certainly *R. rosacea*, Pers. Obs., belongs to a firm species, without striæ; it is also mild.—*Hym. Eur. 444.*

Taste mild, edible. Large, wholly very compact and firm, but the flesh is cheesy, not granular. Stem 3 in. long, often 1 in. thick, even, white or rosy. Pileus nearly equally fleshy, convex, then expanded, scarcely depressed, obtuse, 3 in. broad, opaque, unpolished, surface spuriously silky, at length often cracking into scales, decoloured. Colour beautiful rosy blood-red, growing pale, becoming whitish principally at the disc. Gills rounded behind, rather thick, somewhat crowded, often furcate, connected by veins, edge, chiefly about the margin, often red, because the margin of the pileus is continuous with the gills, as also in *R. rubra*.—*Fr. Mon. 191.*

SPORES $8-10 \times 6-8 \mu$ (Britz.), $8-10 \times 6-8 \mu$ (Sacc.), $10 \times 8 \mu$ (M. C. C.).

The following species of *Secretan* is referred here doubtfully by Fries :—

R. roseo-granulatus. *Secr.* 513.

var. A. Pileus bleached in the centre, washed with rose, more or less lively at the margin. It is subject to tessellate, the labyrinthine compartments becoming reddish, the rosy part is distributed in mealy patches. At length the colour sometimes gives the whole pileus a bistre tint. It approaches convex, the centre a little depressed, then plane, and finally concave, the margin festooned with a few striæ. Diam. 3 in. Flesh white, firm, 4 lines.

Stem white, compact, sometimes covered with a weak rose tint, 2 in. long, 6 lines thick, the summit thickened, as an arch, a little curved, and augmented at the base. It is soft in old age. This species is dry and solid.

Gills white, numerous, 3 lines, slender, straight or convex, leaving an empty space round the stem, with a sort of gorge (channel).

Under pines.

var. B. I found under pines a variety with the pileus entirely white and mealy, diam. $3\frac{1}{2}$ in.; the flesh reached a thickness of 5 lines, the gills turning yellowish, the stem becoming wholly rose. We observed, in old age, the stem and gills with spots of jonquil yellow, very remarkable.—*Secretan*.

Russula (Rigidæ) rubra. *Fries Epicr.* 354. *Hym. Eur.* 444. *Mon.* II., 191. *Sverig. Svamp. t.* 49. *Berk. Outl. p.* 212. *Cooke Hdbk.* 1., No. 624, II., 1203. *Stenerson B. F.* II., 120. *Sacc. Syll.* 1817. *Gill. Champ.* 223. *Lamotte Belg.* 322. *Kickx. Fland.* 205. *Roq. Méd. t.* 5, f. 2. *Agaricus ruber, Barla t.* 15, f. 1-10. *Krombh. t.* 65, *Ag. sanguineus, Vitt. Mang. t.* 38, f. 2. *Schæff. Icon. t.* 15, f. 4-6. *Ag. pulcherrima, Secr. Suisse No.* 506.

Acrid. Pileus fleshy, rigid, convex, then flattened or depressed, polished when dry, becoming even; margin spreading, obtuse, without striæ, hard, stout, varying from white to red; gills obtusely adnate, somewhat crowded, whitish, forked and dimidiate ones intermixed.

In woods.

Very hard, rigid, flesh somewhat grumous, very distinct. Pileus, by reason of its intense vermilion colour, almost shining, but it occurs, also growing pale, rather tan coloured, and cracking; disc commonly darker. Flesh under the cuticle red. Gills when old turning yellowish, the edge often red. *Secr.* No. 506. Poisonous.—*Hym. Eur.* 444.

Very acid. Very hard and rigid, differing from the rest of the species in this tribe in the pileus being polished, becoming even,

although without pellicle, flesh somewhat grumous, and taste very bitter. Stem solid, even, varying from white to red, 2-3 in. long, 1 in. thick. Pileus compact, hard and fragile, convex, then plane, ordinarily depressed, absolutely dry, without pellicle, but polished, becoming smooth, of one colour, cinnabar-vermilion, but getting pale with age, tan-coloured, and often rivulose cracked, disc darker; margin spreading, obtuse, even, always persistent; flesh white, red under the cuticle. Gills obtusely adnate, rather crowded, whitish, then turning yellowish, mixed with forked and dimidiate ones. Spores whitish.—*Mon.* 192.

SPORES $10 \times 8 \mu$ (Britz.), 8-10 μ (Karst.), 8-10 μ long (Bizz.), 8-10 μ (Sacc.).

var. **pallens.** *Bizzozero*, p. 56.

Pileus pale, otherwise same as the type.

The species called *pulcherrima*, by Secretan, and referred to this by Fries, is thus described:—

Pileus at first a fine red, shining and of one colour, it is then spherical, and sunk in the herbage. The colour is after of a cherry red, very bright, very dark rose, often dark purple at the centre. It is dull, covered with meal, which is distributed in a very fine granulation. Convex, then plane, at length concave. Diam. 4 in. Flesh white, granular, brittle, 6 lines thick, descending irregularly into the gills. It is red under the cuticle.

Gills white, getting yellowish at their superior extremity, but the edge is purplish, which is most visible near the stem, and the margin of the pileus 4 lines wide, the greatest width at the extremity of the pileus, and are very narrow near the stem. They are fragile, straight, or slightly convex, adhering after a short and deep return, furcate, anastomosing.

Stem white, streaked with rose tints, 3 in. long, 9-15 lines thick, straight or curved, swollen at the base, which terminates in a point. This plant is heavy, solid, and brittle. Odour strong, penetrating.—*Secr.* No. 506.

We have included the following as a variety of the present species:—

var. **sapida.** *Cooke Illus. t.* 1087, *Handbk.* II., No. 1203. *Agaricus atropurpureus*, *Krombh. t.* 64, *f.* 5-6.

Large, fleshy, plane (3-4 in diam.), then depressed, dark purple, shining, dry, or rather viscid in wet weather, margin quite entire, even; stem straight, solid, stuffed, white, somewhat cylindrical; gills fleshy, often furcate, broad, white, entire. Flesh white, firm, taste mild. (Spores 10 μ diam.).—*Krombh.*

Amongst grass.

This is referred by Fries to *Russula emetica*, but the persistently mild taste, absence of marginal striæ and other points separates it from that species. Pileus 3 to 4 in. diameter, with the appearance of our usual form of *R. rubra*. It is still somewhat doubtful whether it should be regarded as a variety or a distinct species. This will depend on individual estimate of the value to be attached to mildness or acidity.

Russula (Rigidæ) Linnæi. *Fries Epic. p. 356. Hym. Eur. 444. Mon. II., 192. Kickx. Fland. 205. Lambotte Belg. 323. Gill. Champ. 235. Cooke Hdbk. II., 1204. Stevenson B. F. II., 120. Cooke Illus. t. 1026. Sacc. Syll. 1818.*

Mild. Pileus everywhere fleshy, plane, then depressed, *polished, dry, smooth*; margin spreading, obtuse, without striæ; flesh spongy, compact, white; stem spongy, solid, stout, rivulose, red; gills adnate, rather decurrent, somewhat thick, white, turning yellowish, sometimes dichotomous and anastomosing behind.

In woods. Rare.

Habit exactly that of *R. emetica*, substance also floccose, but very compact, firm, thick; stem $1\frac{1}{2}$ in. long, rather ventricose at the middle, and 1 in. thick, intense blood red (but varies also to white), obsoletely fibrillose-reticulate. Pileus without pellicle, of one colour, dark purple, blood red, etc., opaque, not becoming pale, 3-4 in. broad. Gills scarcely crowded, rarely connected by veins, a few dimidiate, divided behind. Spores whitish. Secretan, No. 490, appears to come near to this.—*Hym. Eur. 444.*

Splendid. Taste mild. Stem stout, firm but spongy, soft within, hollow, $1\frac{1}{4}$ in. or more long, 1 in. or more thick, rather ventricose, obsoletely fibrillose-reticulate, in my specimens intense blood red. Pileus everywhere fleshy, rigid, plane, depressed, 3-4 in. diameter, sometimes repand, even, smooth, dry, without separate pellicle, of one colour, a beautiful deep blood-red or bright rose; margin spreading, obtuse, without striæ. Flesh thick, spongy, compact, white. Gills decurrent, rather thick, not crowded, broad, fragile, sparingly connected by veins, white, turning yellowish when dry, mixed with a few dimidiate ones, anastomosing behind. Spores white.—*Mon. 193.*

SPORES subglobose, $11\ \mu$ (Quelet), $8-10 \times 8\ \mu$ (Britz.), $8-11 \times 8\ \mu$ (Sacc.).

As Fries, in his *Epicrisis*, refers Secretan's No. 490 both to this species and *Russula integra*, it is clear that it is not a good representation of either, and hence we have not included it here.

Russula (Rigidæ) xerampelina (Schæff.). *Fries Epicrisis 356. Fr. Hym. Eur. 445. Fr. Mon. 192. Gill. Champ. 236. Quelet Jura 307. Karsten Hatscamp 205. Saccardo Syll. 1821. Stevenson B. F. II., 121. Cooke Hdbk. II., 1205. Grevillea VI., 122. Cooke Illus. t. 1053, 1074. Agaricus xerampelinus, Schæff. Icon. t. 214-215. Agaricus tinctorius, Secr. Suis. No. 487.*

Mild, pileus fleshy, compact, convex, then plane and depressed, dry, opaque, even, and *minutely cracked*; margin straight, even; *flesh compact, white, turning yellowish*; stem stout, firm, clavate, even, white, or reddish, at length spongy and soft; gills adnexed, rather crowded, furcate behind, white, then tan coloured.

In fir woods.

As *R. Linnaei* approaches *R. emetica* so this approaches *R. integra*, but differs in its firm substance, the cuticle of the pileus not being distinct, whereupon the pileus is always dry, and commonly rimosely punctate. The pileus is purple rose, the disc becoming pale, yellowish white. Spores dingy tan colour. Stem redder when moist.—*Hym. Eur.* 445.

Taste mild. Stem stout, firm, at length spongy within, soft, hollow, 2-3 in. long, 1 in. thick, usually thickened at the base, even, white, or reddish. Pileus fleshy, compact, convex, then flattened, at length depressed, 3 in. and more diam., *without a distinct pellicle*, always dry, opaque, even, but when old commonly very finely cracked, and *the cuticle under a lens is seen to be very delicately granulate or punctate*; margin patent, without striæ. Colour of the pileus variable, commonly *purple-rose*, with the disc growing pale, and becoming yellowish white, sometimes verging on olive. Flesh compact, *white, turning yellowish*. Gills adnexed, rather crowded, broadest in front, furcate behind, whitish, then becoming yellowish. Spores dingy tan colour.—*Fr. Mon.* 192.

SPORES $8.9 \times 6.7 \mu$ (Britz.), $8.9 \times 6.7 \mu$ (Sacc.), 9×8 or $9.10 \times 7.8 \mu$ (M. C. C.).

Pileus dull rose, mealy, the centre yellowish white, of a large size, the margin frequently of a bright rose, which is determined by the white of the centre, the rose tint of the margin is distributed in irregular spots. Diam. $3\frac{1}{2}$ in. Flesh white, 4 lines thick. Gills becoming yellow at the base, which produces a changing appearance from white to yellow, 4 lines wide, slender at the edge, veined at the base, touching by a point, and tending to detach themselves from the stem. Stem very white, dull, mealy, sometimes in drying having a faint rosy tint, mealy especially at the apex, 2 in. long, 8 lines thick, swollen conically next the pileus, and curved. Solid and firm, the odour penetrating and agreeable.—*Ag. tinctorius*, var. B., *Secr.* No. 487.

The above description corresponds to the ordinary form which we have seen in this country, but the stem is very seldom at all tinged with rose, and when the mealiness disappears is often faintly striate. The disc sometimes remains darker than the rest of the pileus, not becoming decoloured or yellowish, but is always, more or less, speedily granular under a lens, from the breaking up of the cuticle.

Although described as not having a distinct pellicle, it is easy in damp weather to strip off the cuticle from the margin inwards for half an inch or more; beyond this it is truly adnate.

The colour of the pileus from the margin up to the decoloured disc varies in intensity as well as in tone. Sometimes the rose is replaced by lilac, almost violet, or, more commonly, by a light warm brown, tinged with purple or rose. The disc also deepens into orange or orange brown. Whatever the variations in colour may be, the breaking up of the cuticle into granules seems permanent, and distinguishes the species. It is more minute and of a different character to the cracking of the cuticle in *R. cutefracta*. When cut the flesh of the stem commonly turns foxy at the base, but no odour is distinguishable.—*M. C. C.*

We have never seen specimens which we could refer to either of the other two forms described by Secretan, as follows:—

R. tinctoria. *Secr.*

Pileus when young of rather a finer rose colour at the margin, later on zoned with red, the centre dark, of a dull aspect. The general colour passes to a very bright purple, always opaque, then of a dark purple, mixed with yellow at the centre, and finally of a deep lilac, with a large yellowish-white centre. In form it approaches convex, with the margin perpendicular, and the centre prominent; at length the centre is depressed, and the pileus becomes plane. Diam. $3\frac{3}{4}$ in. Flesh yellowish-white, firm, compact, 6 lines thick. Gills nearly white, then yellow, bright, numerous, rather fragile, 3-4 lines wide, their greatest width by the margin of the pileus. Many of them are furcate, and branched behind near the stem. Stem white, $2\frac{1}{2}$ in. long, 9-11 lines thick, straight, or slightly curved, thickened below, at first very hard, then becoming soft, and at length hollow. What is very remarkable is that the plant in the young state throws off water, which leaves a tint of beautiful rose.—*Secr.* 487A.

R. pallida. *Secr.*

Pileus dull-white, with faint tints of rose, which pass into light violet. For some time plane, then concave, the margin turned up. In dry weather the surface is broken in the form of large scales, and the margin deeply split. Diam. $4\frac{1}{2}$ in. Gills white, beginning to turn yellow at the circumference, and at length becoming yellow, rather numerous, 5 lines wide, straight, or following the inflection of the pileus, distant from the stem. Stem dull-white, with a rosy tint at the apex, $1\frac{1}{2}$ in. long, 9 lines thick, swollen above and below, and rounded at the base. At first solid, then becoming soft.—*Secr.* No. 487C.

Gillet has a variety called *rubromarginata*, from the edges of the

gills assuming a red tint, but this can hardly be considered more than a "form."

Russula (Rigidæ) olivacea (Schæff.). *Fries Epicr.* 356. *Fr. Hym. Eur.* 445. *Sacc. Syll.* 1824. *Cooke Hdbk.* II., 1206. *Stevenson B. F.* II., 121. *Cooke Illus. t.* 10+1. *Gill. Champ.* 236. *Agaricus olivaceus*, *Schæff. Icon. t.* 204.

Mild; pileus fleshy, convex, then flattened and depressed, rather silky and squamulose; margin spreading, even, flesh white, then somewhat yellowish; stem firm, ventricose, pale rose or pallid, internally spongy, stuffed; gills adnexed, broad, yellow, mixed with shorter and furcate ones.

In mountain fir woods. Rare.

Allied to *R. rubra*, but stem definitely spongy, pileus unpolished, gills soft and brightly coloured; certainly distinct; corresponding to *R. alutacea*. Colour of the pileus from dingy purple to olive, or altogether tawny-olive. Spores yellow.—*Hym. Eur.* 445.

SPORES globose, 10 μ (Quelet), 10 μ (Sacc.).

Fries in *Hym. Eur.* refers the following, from its habit, to the present species.

Pileus approaching a mixture of olive, of green, and of dark brown, the injured places obtaining purple tints; at other times the first tint is deep olive green, of one colour, dull, like cloth; later, sometimes it remains olive, greyish at the margin, more deep at the centre, sometimes it turns a light purple at the margin, darker at the centre, sometimes it becomes all dark crimson. Finally the middle offers a yellowish mixture, which in old age is blanched; the aspect is dull, as if mealy. The first form is convex, the summit flattened, the margin folded beneath, widens, becomes plane, and then a little concave; diam. 6 in. Flesh white, taking at last yellowish tints, visous under the cuticle. It is rather soft in the interior, but it is enclosed in a stem with a sort of firm bark, thick and hard when young. The thickness of the flesh of the pileus is 9 lines; it enters into the gills.

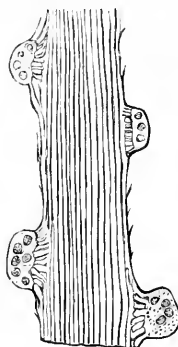
Gills for some time with a yellowish lustre, finally ochre-yellow, shining; they are almost crowded, and appear numerous; they prove remote in old age; they follow the contour of the pileus, are adnate at the same level, and are easily bifid at that point, 6 lines wide, and preserve the same near the margin of the pileus, very fragile, soapy to the touch.

Stem washed with a fine rose. This tint, which appears in youth near the gills, extends afterwards through the whole stem; it is more pronounced on one side than the other ($2\frac{3}{4}$ in. long, the thickness of a good thumb). Straight, or a little curved, swollen above in old age, sometimes a little ventricose about the base, ordinarily attenuated, and slightly curved at the foot, holding the odour of the fir. In dry seasons the pileus cracks into deep fragments, which show the white flesh.—*Secr.* 489.

RECENT OBSERVATIONS OF DR. NYLANDER ON SCHWENDENERISM.

TRANSLATED BY THE REV. J. M. CROMBIE, F.L.S.

In his "Sertum Lichenæ Tropicæ e Labnan et Singapore," just published Nylander (pp. 31-34) makes the following pertinent and important observations on this subject, which I have translated for the benefit of the readers of "Grevillea":—There is nothing easier for the refutation of the Schwendenerian hypothesis than observing the formation and evolution of the gonidia in the thalline granules, which are adnate on the erect chondroid axes of *Stercocaulon* and the *Cladonie*. I have elsewhere shown (Lich. Fueg., p. 30) that these podetial axes constitute in the chondrohyphal portion a firm, erect cylindrical hypothallus, upon which, and from which, originate the mycelohyphæ (which are nothing else than the chondrohyphæ seceding or segregated from the axis) with the glomerules of the thallus itself, which are composed of the medulla, gonidia, and at the same time of the cortex or cortical cells. These glomerules are variously explicated, and become at length for different types—granulose, squamulose, papillose, or fibrillose. But in their first granuliform beginnings an excellent opportunity is always found of observing the origin of the gonidia, which one may see in the act of growing. It is at the same time to be noted that the gonidiogenous thalline glomerules occur scattered upon the naked axis of the podetium where no gonidia are vagrant, so that none such can consequently come from without. Nor could they come from the substratum or the ground except by creeping up the erect cylinder of the axis—a movement impossible for them since they are entirely destitute of any kind of organs of ascension. We can, however, clearly see that the gonidia arise, and are formed in the cells of the said glomeruli.



The annexed figure shows four young glomerules growing upon a fragment of the naked stipe of a *Stercocaulon*, sufficiently demonstrating that the gonidia are produced in these glomerules. It is thus scientific matters are expressly to be proved by the results of accurate observations; but such as rest upon hypothesis only, or affirmation only (nowadays called "suppositions, convictions," etc.), are of no value, of no serious weight, are to be regarded as worthless.

We may notice and compare what Talasne obtained by culture (Mem. Lich. t. xi., f. 17, "Thalle naissant," and t. xiii., f. 5-13), which affords a most true, most sincere, and most complete example of the germination of the lichen-spores, proceeding from the spore to the formation of the gonidia within the cellular prothalline glomerules, which he thus indicates in the explanation

of the table : " Des groupes de cellules, dont quelques-unes seulement, plus grosses que les autres, contiennent de la chlorophylle et des filaments, sur lesquels ces cellules ont pris naissance " (Cfr. Nyl. Fueg., p. 32-33).

The same I have formerly declared (Flora, 1885, p. 30) is to be observed in the formation of gonimia in the cephalodia of some *Stercocaula* in an analogous condition. The Schwendenerians attribute a singular intelligence and very subtle perspicacity to the germs of lichens, for in these germs, according to their opinion, there is inherent a faculty of selecting special "algæ," which they may be found surrounding, attracting and introducing into their textures that they may become *gonidia*. And as each lichen has its own proper gonidic type, it follows that there is need of a marvellous subtilty and judgment that that sole necessary type be not mixed up with another, and that in its place there be not admitted another incongruous "algal." But "majora canamus," the gonidic adult lichen, would rejoice in a still more subtle diagnostic faculty, for in the case of not a few species it would also have set before it the seeking out and snatching to itself its own "algal"—not, indeed, a gonidiomorphous "algal" (for such it already possesses), but an additional syngonimic algal, in order that cephalodia may be formed, in whose texture there occur gonimia or syngonimia as a peculiar anatomical system, composed in certain species by *Nostoc*, in others by *Scytonema*, and in others by *Sirosiphon*. (Fries fil., in discovering and pathologically explaining the history of these, has wonderfully distinguished himself, but *vide* Nyl. Lapp. Or., p. 117.) All of these things have, indeed, subtilely to be weighed and discerned by the lichen, bringing forth cephalodia, in order that there may be no mistake in the selection. Thus, after its first infancy, a lichen would seem to have obtained a more acute intelligence, along with an incomparable shrewdness in subjoining to itself, as symbiologists think, algal elements of the same sort. The necessary syngonimia upon the ground, on stone, or on bark would then be laid hold of by the hyphal tentacles (endowed with a magical power) of the lichen there expanded, and would be intruded where a place in the cephalodic fabric was predestined. The Schwendenerian fabulists would have it to be so, although certainly nobody ever saw, and certainly never will see, anything of the kind. But a still graver consideration stands in the way, if you set about explaining in what way those syngonimia come to *fruticulose* lichens. For in this case "algæ" would run to them, not from the nearest substratum, but from afar, leaping or flying through the air; every other way, every other method, fails. Exotic *Stercocaula*, often five inches in height, adorned with cephalodia in the upper portion of the fruticle, could by no other mode, from the substratum or the vicinity, seize or receive these "algals" in the places of the podetia where they are present; nor have the cephalodia a syngonimiose communication among them-

selves, nor are syngonimia anywhere visible in the stercocauline thallus or podetia, unless in the cephalodia themselves. And there remains to be explained the very difficult operation of penetration into the textures. All these allegations belong to inept Schwendenerism, and scarcely deserve even to be reviewed and castigated, so puerile are they—the offspring of inexperience and of a very light imagination. No true science is there.

I have previously shown that all the Schwendenerian “Algæ” are lichens, and entirely of a lichenose nature. (*Vide* Lich. Japon., pp. 100-111.)

In addition, a philosophical consideration stands prominently forth in this question, viz., that the types of gonidia and gonimia are systematically in all parts conjoined with the types of the species to which they belong. And, indeed, we see that a good many lichens present an intimate connection—gonidic, and, at the same time, gonimic, the types being constant, so that they may be regarded as bound to a double Schwendenerism. The systematic congruity which is always present in the thalline texture of every lichen between the gonidia and its other anatomical elements, expressing its own common character in the systematic series jointly in each species, repudiates and absolutely refutes all Schwendenerism. And not otherwise systematically do the spermogones in lichens, constantly connected with their thalli, demonstrate a parallelism, everywhere organic and perfect, with their apothecia; and in a systematic respect the spermogones are evidently of equal weight with the former (*vide* Nyl. Lich. Fret. Behring, p. 77), and accordingly cannot be conceived of otherwise than as male organs. Thus the gonidia, apothecia, and spermogones, formed by a common genesis, constitute necessary and essential organs of every lichen. A lichen exists solely through their genetic and organic unity. Those who there discern a “Fungus” and “Algal” imagine mere fables.

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Grevillea.

A QUARTERLY RECORD OF CRYPTOGAMIC BOTANY
AND ITS LITERATURE.

AUSTRALIAN FUNGI.

By M. C. COOKE.

(Continued from p. 36).

Ustilago confusa, *Massee*.

Sori produced in the ovary, soon naked, mass of spores pulverulent, violet-black; spores clear brown, with a tinge of violet by transmitted light, epispore about $1\ \mu$ thick, perfectly smooth, subglobose, or irregularly angular ($11-14\ \mu$).

On *Panicum paradoxum*. Victoria.

Previously confounded with *Ustilago destruens*, from which it is distinct.

Læstadia Litseæ, *B. & Br.* (Sphærella).

Spots irregular or suborbicular, on the upper surface, becoming pallid, with a broad brown border. Perithecia semi-innate, black, punctiform. Asci clavate. Sporidia elongated, elliptical, continuous ($20-30\ \mu$ long), hyaline.

On leaves of *Litsea*. Queensland.

Sphæropsis numerosa, *Cke. & Mass.*

Gregarious; perithecia semi-immersed, or nearly superficial, globose, black, becoming flattened; sporules elliptical, continuous, brown, $15 \times 8\ \mu$.

On dead bark. Dimboola. Victoria. (*Reader*, 16.)

Asteromella homalanthi, *Cooke & Mass.*

Spots suborbicular, on both surfaces, fuliginous ($1\ \text{c.m. diam.}$); dotted with the minute black punctiform superficial perithecia. Sporules elliptic, hyaline ($5 \times 3\ \mu$).

On leaves of *Homalanthus populifolius*. Queensland. (*Bailey*, 923.)

Melophia leptospermi, *Cooke*.

This was published under the name of *Melophia phyllachoroidea*, Cke., but since discovered that the specific name is preoccupied by *Speggazini*.

EVOLUTION OF PLANT-LIFE.*

"The aim of the present book is to briefly indicate, in a broad sense, the most pronounced features—structural and physiological—that characterize plant-life, as manifested at the present day, coupled with an attempt to trace the evolution of existing forms from primitive types, and to illustrate the interdependence between plants, animals, and inorganic nature."

Thus much we learn of the scope of the work before us from its preface, whilst the title informs us that the illustrations of plant-life are confined to the "lower forms." The first chapter is devoted to introductory matter, which is followed by chapters on Mycetozoa, Algæ, Lichenes, Characeæ, Muscineæ, Pteridophyta, and Phanerogamia—the latter being limited to about four pages of definition. At first it might be supposed that the use of the word Mycetozoa, in preference to Myxomycetes, indicated a decided leaning towards the "animal nature" of the organisms included under that term, but such is not the case, for it is stated that "the spontaneous movements exhibited by the swarm spores are not supposed to prove their animal nature, as similar motile cells occur in seaweeds, mosses, and ferns. During the reproductive phase the whole of the differentiation exhibited is in the direction of plant-life, in a rudimentary form, as would be expected."

Curiously enough Fungi are not mentioned in the synopsis at the head of the chapters, and yet fifty pages are devoted to them, at the end of Chapter III., which stands in the table of contents as "Algæ," whereas Algæ are treated of in the first portion of the chapter, and Fungi in the latter. We have no intention of pursuing an analysis of this handy little volume, but simply to indicate its scope and aim. Of course all the suggestions as to the evolution of the various groups are matters of opinion, and might be open to discussion, but as they induce thought and reflection, will serve a useful purpose. "The Fungi are considered as having descended by degeneration from the Algæ, and for this reason are placed immediately after the last mentioned class, although in reality they must be considered as a side and terminal group, not connecting with any higher type of plant development."

As a preliminary to the study of the Cryptogamia this volume will be welcomed, although the subjects are not equally balanced, since Algæ and Fungi take up 100 pages, with only five for the Mycetozoa, and 40 pages for the residue of the Cryptogamia. We think there is need for a larger and more exhaustive introduction to the study of the different groups of the Cryptogamous plants.

* "The Evolution of Plant-Life, Lower Forms," by G. Massee (University Extension Series). London: Methuen and Co., 1891.

HIMALAYAN TRUFFLES.

Some kind of truffle has, for many years, been known to grow at the base of the Himalayas, and probably more than one kind, yet, strangely enough, none have ever been sent to Europe for identification. Year after year we have sent requests to the North West Provinces for a specimen or two of the indigenous truffle. It was only a few days since that the long-hoped-for parcel made its appearance. The natives know the truffle under a native name, and they are fully aware of its esculent qualities. It has even been stated that they are sold occasionally in the bazaars, but, if so, it is remarkable that none were ever sent with the large consignments of raw products to the various exhibitions in Europe, from 1851 to the present. On this point we can speak with some confidence, from our official connection with the Indian Department for above a quarter of a century. Through the kindness of Mr. Duthie, of Saharunpore, we have seen our first Himalayan truffles, and although in books a haphazard guess has been made of the species, by calling it either *Tuber æstivum* or *Tuber cibarium*, it proves to be neither the one nor the other, but more closely allied to the French truffle, *Tuber melanosporum*, but much smaller, and with sporidia scarcely more than one-half the size, and, indeed, the sporidia are much smaller than in any other of the species with aculeate sporidia.

Under these circumstances we have been compelled to recognize the Indian as a distinct species, under the name of *Tuber indicum*, of which a description is annexed.

The truffles, in the dried condition in which we received them, do not exceed an inch in diameter, and many are not half that size. They are possibly nearly globose when fresh, but in parting with moisture become more or less irregular, depressed, and lobed. The outer surface is sooty-black, covered with angular five or six-sided warts, smaller than in the common truffle. The interior is blackish, with whitish sinuous veins, so that it is irregularly mottled. The asci are nearly globose, and appear normally to enclose four sporidia. These sporidia are elliptical and brown, densely covered with rather long truncate spines, or warts. In this latter feature they agree with the sporidia of *Tuber melanosporum*, but the difference in size is very characteristic. We do not recognize any particular odour.

***Tuber (Oogaster) indicum*, Cke. & Mass.**

Globosum, irregulare (plerumque 2-3 c.m. diam.), verrucis subhexagonis asperatum, fuligineo-nigrum; gleba carnosa, nigrescente, venis albidis gyrosis marmorata; ascis subglobosis, 2-4 sporis; sporidiis ellipsoideis, dense longeque aculeatis, minimis, brunneis (15-18 \times 10-12 μ), aculeis apicem truncatis.

In the ground. Mussooree, N.W. Himalayas. (*Duthie.*)

RUSSULA REDIVIVA.

(Continued from p. 59.)

HETEROPHYLLÆ. *Fries Hym. Eur.* 446.

Pileus fleshy, firm, with a thin margin, which is at first inflexed, then expanded and striate, covered with a thin adnate pellicle. The gills consist of many shorter mixed with the longer ones, along with others which are forked. Stem solid, stout, spongy within.

- 1209. *Russula (Heterophyllæ) vesca.*** *Fries Epic.* 352. *Hym. Eur.* 446. *Mon. Hym.* 193. *Stevenson B. F.* II., 122. *Cooke Hdbk. No.* 1209. *Cooke Illus. t.* 1075. *Hussey I., t.* 89. *Fries Sver. Svam. t.* 63 (a receding form). *Berk. Outl.* 211. *Sacc. Syll. No.* 1827. *Bresad. Trident t.* 95.

Mild, sweet-tasted. Pileus fleshy, firm, umbilicato-convex, then plane and infundibuliform, *venoso-rugose*, and streaked; *reddish flesh colour, disc darker*, flesh under the viscid cuticle reddish; margin even, or remotely striate; stem firm, unequal, *reticulate-rugose*; gills adnate, rather crowded, unequal, and forked, white, as well as the stem.

In woods. Esculent. Flesh white. Taste mild, pleasant. *Fr. Hym. Eur.* 446.

Stem solid, compact, externally rigid, reticulated-rugose in a peculiar manner, sometimes attenuated at the base, white. Pileus fleshy, rather firm, plane, depressed, rugulose-veined, with a viscid pellicle, red flesh colour, with the disc darker, margin at length spreading. Flesh cheesy, firm, white. Gills adnate, crowded, thin, white, many unequal and forcate intermixed, but scarcely connected by veins. Of medium size. Taste mild, pleasant, reckoned edible.—*Fr. Mon. p.* 193.

SPORES minutely echinulate, subglobose, 7-8 μ (Bres.).

Fries has referred none of Secretan's descriptions to this species. It is not always easy to distinguish this from *R. cyanoxantha*, but the disc is usually darker than the margin, whereas in the latter the disc becomes pale. In *R. vesca* the stem is commonly rugose or reticulated, whilst in the other species it is even. We have not recognized any blue or green colouring in the pileus of *R. vesca*, although usual in *R. cyanoxantha*. There is sometimes a crab-like odour, and the flesh is liable to become brownish when bruised. In some respects *Russula du Portii*, Phill., is allied to this species.—*M. C. C.*

- 1210. *Russula (Heterophyllæ) lilacea.*** *Quel. Bull. Soc. Bot. Fr.* 1876, t. II., f. 8. *Cooke Hdbk.* II., 1210. *Cooke Illus. t.* 1054. *Sacc. Syll. No.* 1828.

Pileus convex, then depressed, rather fleshy, viscid, violet or purple, margin growing pale, striate (5-8 c.m. diam.), flesh violet

under the cuticle; stem spongy, corticate, fragile, pruinose above, rosy at the base, gills distant, ventricose, white, connected by veins.

In moist woods. Odour faint, pleasant; taste mild.

We have only met with this species two or three times, which agrees in some features with *R. vesca*, but with the margin striate; this is also sometimes faintly traced in *R. vesca*. The stem is softer, and more spongy, usually attenuated and rosy below, but white and pruinose above. Whether it will be maintained as a distinct species depends upon a more extended acquaintance, but it certainly differs in habit and appearance.—*M. C. C.*

1211. *Russula (Heterophyllæ) azurea.* *Bres. Fungi Trid. t. 24.*
Cooke Hdbk. II., 1211. Cooke Illus. t. 1088. Sacc. Syll. 1845.

Pileus fleshy, convex, then plane or depressed, soon dry and even, constantly minutely granulose, margin scarcely striate, bright blue, margin sometimes lilac, growing pale, cuticle separable (4-6 c.m. diam.), stem white, ventricose, or clavate at the base, smooth, rugulose, rather firm, spongy, a little hollow when old (4-5 c.m. × 10-15 m.m.), flesh white, mild; gills crowded, equal, attenuated behind, adnexed, and bifid, white, unchangeable.—*Bresadola.*

In fir woods.

In former times this little species was undoubtedly, in this country, included under *Russula heterophylla*, with which it still seems to be more closely allied, or *Russula cyanoxantha*, than with *R. emetica* and other species of *Fragiles*. When fresh the pileus is covered with a delicate "bloom" like that of plums.—*M. C. C.*

SPORES 9 × 8 μ.

1212. *Russula (Heterophyllæ) cyanoxantha.* *Schæff. Ic. t. 93.*
Fr. Hym. Eur. 446. Fr. Mon. p. 194. Sacc. Syll. 1829. Paul. t. 76,
f. 1-3. Stevenson II., 122. Cooke Hdbk. II., 1212. Cooke Illus. t.
1043, 1076, 1077. Kromb. t. 67, fig. 16-19. Vittadini t. 27.

Mild, pileus compact, convexo-plane, then depressed or infundibuliform, viscid, *variegated*, margin rather blue, at length faintly striate, stem spongy, stuffed, *even*, smooth, white, gills rounded behind, broad, mixed with shorter ones, and furcate, white.

In woods. Beech, etc.

Flesh firm, cheesy, commonly reddish under the separable pellicle. Colour peculiar, from lilac or purplish, greenish-olive, disc commonly growing pale, sometimes turning yellowish.—*Fr. Hym. Eur. 446.*

Taste mild, pleasant, allied to *R. vesca*, but the colour of the pileus in that species is immutable, in this it is variable, and on other points constantly different. Stem spongy, stuffed, but firm, when old sometimes hollow, 2-3 in. long, to 1 in. thick, equal,

smooth, even, white. Pileus compact, convex, then plane, then depressed or infundibuliform, 2-3 in. broad and high, now even, now rugose, or virgate, viscid, margin deflexed, then expanded, remotely and faintly striate, colour of the pileus mutable, in typical form from lilac or purpurescent to olive-green, disc commonly growing pale, sometimes yellowish, margin commonly turning bluish or livid purple. Flesh firm, cheesy, white, reddish under the separable cuticle. Gills rounded behind, connected by veins, less crowded, broad, furcate, unmixed with shorter ones, white. Varies when old, with the pileus pallid, greenish-white, or mixed with a purple colour.—*Fries Mon.* 194.

SPORES 8-10 \times 6-8 μ (Britz.), (Sacc.), 10 μ diam. (M. C. C.), 9-8 μ (M. C. C.).

Fries has referred the following forms from Secretan to the present species.

R. cyanoxantha. *Secr.* No. 520. *Schæff.* t. 93. *Bolt.* t. 1 (*Fig. sup.*). *Pers. Sym.* p. 445.

var. A. Pileus in youth slate-grey, dull and deep; it takes then at the margin a variable, undecided tint, between greenish, bluish, and purple. The centre shows purple patches in youth, and orange when the plant is old. At this epoch the sides turn greenish. The surface is covered with a fine hairiness. It approaches hemispherical, the centre in good time depressed. It shows then often lobed and divided by a deep groove, like one sees in peaches. It becomes successively convex, plane, the edges folded under, the centre sunken, then concave, the margin split deeply. It is soon eaten beneath by insects. Diam. 5 in., 5 lines thick. The cuticle is raised easily. Flesh white, firm, vinous under the skin.

Gills white at all ages, numerous, fragile, nearly all furcate at different lengths, nearly convex, then slightly arcuate or straight, adnate by one bifid extremity, a little decurrent, 3 lines wide, with a few short gills.

Stem white, almost shining, $3\frac{1}{2}$ in. long, 9-10 lines thick, cylindrical, hard, slightly thickened at the apex and the base, sometimes a little compressed. It takes spots coloured red-brown. The foot is recurved and pointed. The odour a little agreeable.—*Secr.* No. 520.

var. B. This variety is intermediate between the variety A and *Ag. furcatus*.

Pileus, the tint is always very deep, the colour of dark purple at the margin and the centre; in old age the purple gives place to a deep green. The applied chevalure forms a network of crowded meshes, blackish, shining, and which does not prevent the surface being very smooth and a little viscid. The flesh becomes vinous to a considerable depth.

Gills, 5 lines wide, are flabby, and easily reduced to a paste.

The stem, curved, ventricose, is attenuated at the base, it is pure white.

Under firs. July, August.

Obs. We distinguish this species from *A. lividus* (No. 521) especially by its colour in infancy, and by the purple tints of the centre, which do not exist in any other species. When it becomes greenish in old age care must be taken not to confound it with *R. furcata*, from which it is distinguished by the numerous gills and their flabbiness.—*Secr. No. 520.*

The species above called *A. lividus* is most probably *R. heterophylla*.

R. vaga. *Secr. No. 523.*

var. A. Pileus approaching light purple, mixed with olive, dull, then deep purple red, the centre greenish olive. It is some time plane, finally a little concave, umbonate in the centre. Diam. 3 in. It is at length shining, a little viscid, margin striate and tuberculose. Flesh white, rather firm, 4 lines thick, conical, vinous under the cuticle, which is easily raised.

Gills white, numerous, slender, fragile, straight, adnate, 3 lines broad, united by numerous anastomoses, and serpentine in old age. A few short gills.

Stem covered in its length with a purple tint, swollen insensibly at the base, $2\frac{1}{2}$ in. long, 7-8 lines thick, up to 1 in. Striate with fine whitish streaks. It becomes flabby, and yields to pressure. Odour agreeable and penetrating.—*Secr. No. 523.*

var. B. Differs in its earlier stage, dull olive and convex; it takes afterwards the same tints as the preceding. Finally it is discoloured entirely, and the margin is covered with striæ. The gills remove from the stem, fairly passing as free.—*Secr. No. 523.*

var. C. Pileus in infancy all green, centre darker, afterwards the deep olive centre admits in the middle a tint darker and shining, the sides purple, becoming deep purple, the centre turns to green, mixed at last with yellowish. It approaches convex; the middle, sometimes raised to a rather large boss, is depressed. The pileus becomes in time plane, and then concave, the margin striate and tuberculose at the extremity. Diam. 3 in. Flesh white, 3 lines thick.

Gills dirty white, veined at the base.

Stem 7 lines thick, thickened and deformed at the base, soft, and then hollow. For all the rest the gills and stem resemble those of var. A. The odour is also the same. It is most delicate and fragile.—*Secr. No. 523.*

var. D. It differs from the preceding in its smallness, its diam. not exceeding 2 in. It becomes in old age all black.—*Secr. No. 523.*

Fries does not mention whether he regards all the above forms as

referable to *Russula cyanoxantha*, as some of them seem to approach *R. vesca*.—*M. C. C.*

Berkeley, in a note, says: "I do not think Fries is right in quoting Krombh. t. 67, Figs. 16-19; the figures do not give me a good idea of this species."

1213. *Russula (Heterophyllæ) heterophylla.* *Fr. Hym. Eur.* 446. *Fr. Mon. p.* 194. *Sacc. Syll.* 1830. *Stevenson II.*, 123. *Cooke Hdbk. II.*, 1213. *Cooke Illus. t.* 1044, 1045. *Berk. Outl. t.* 13, f. 5.

Mild, pileus fleshy, firm, convexo-plane, then depressed, even, polished, with a very thin pellicle, margin thin, even, or densely and finely striate, flesh white, stem solid, firm, nearly equal, even, gills attenuated behind, reaching the stem, *very narrow, much crowded, furcate and dimidiate, white.*

In wooded pastures amongst moss.

Pileus from the thin pellicle rather viscid or dry, never becoming red, nor rugoso-virgate, gills crowded, stature commonly shorter and smaller than *Russula cyanoxantha*, differs from *R. virescens* in the thin margin, narrow gills, indeed very narrow. Apex of the stem dilated, so that the gills appear remote. Never seen it red.—*Fr. Hym. Eur.* 446.

Taste always mild, as in *R. cyanoxantha*, from which it differs in size, pileus thinner, even, never reddish or purplish, thin, pellicle closely adnate, stem firm, solid, gills thin, *very narrow, much crowded, white, mixed with many dimidiate and furcate.*—*Fr. Mon.* 194.

SPORES $5 \times 7 \mu$ (W. G. S.), $6-7 \times 5-6 \mu$ (Bizz.), $6-7 \times 5-6 \mu$ (Sacc.).

Fries refers to this species the following numbers of Secretan, 521, 522, 526, etc.

R. livida. *Secr. No.* 521.

var. A. Pileus when young variegated with grey, yellow and purple; colours very bright; surface polished and moist; later the colours are more pronounced. The centre becomes greenish yellow, olive, and very brownish; the purple often of a fine tint, reaches the margin. It appears not of a strong green, nor dark purple in old age. It becomes a little viscid. The form approaches hemispherical, umbonate, then convex, the margin folded and sinuous, the centre umbilicate (for a good time), the margin is not striate. Diam. 6 in. Flesh white, vinous under the cuticle, solid, 6 lines thick.

Stem very white, compact, 3 in. long, 1 in. thick, curved, pointed, and a little compressed at the base. Odour disagreeable.

Gills very white, numerous, serrate, slender, bifurcate at divers lengths. It becomes bifid and a little decurrent at the pedicel, they are veined at the base (soft), and possible to be reduced to a paste when crushed, 3-4 lines broad.

Very common, remarkable for its heaviness.—*Secr. No.* 521.

var. B. Pileus with the margin bright green, mixed with whitish at the centre, the purple and green deeper, finally dark green and shining at the centre, bright green at the margin, the green tint distributed about the edge in little granular patches. It is viscid in the centre. The form is for some time concave at the disc, the margin at first reversed, and then straight. Diam. $3\frac{1}{4}$ in. Flesh a little vinous under the skin. Stem white, $2\frac{1}{2}$ in. long, 1 in. and more thick, compressed, ventricose indented, becoming hollow, fragile. Gills numerous, slender, flabby, very often forked, and reticulate about the stem, $2\frac{1}{2}$ lines broad.—*Secr.* 521.

Under firs. September.

var. C. Centre of the pileus brown, surrounded by orange, the margin bright greenish, smooth and shining. It is flat, depressed in the centre, with the margin a little turned up. Diam. $3\frac{1}{2}$ in. Flesh cheesy, descending into the gills, firm, but brittle. Stem 3 in. long, 10 lines thick, rather ventricose, attenuated at the base. It is remarkable for a bright purplish tint. Gills white, numerous, not anastomosing.—*Secr.* 521.

var. D. The margin of the pileus takes faint purplish tints, the surface powdery and smooth, the flesh vinous under the cuticle, 4 lines thick. Stem 3 in. long, 7 lines thick, attenuated at the apex, bent, a little swollen at the base, catching a faint purplish lustre at the middle. Gills 2 lines broad.—*Secr.* 521.

Among grass under firs. August.

Russula angustata. *Secr. No. 522.*

Pileus when young dark purple, sunk in the ground, afterwards the centre becomes olive grey, and the margin remaining purple; it is glossy, viscid especially at the margin. When old it is bright violet, or otherwise it will take large spots of that colour; from convex it will have the centre depressed, or turn out plane, the centre remaining sunk, and finely wrinkled, the extremity of the margin striate and tuberculose. Diam. $2\frac{3}{4}$ -3 in. Flesh white, cheesy, 4 lines thick.

Stem white, $1\frac{3}{4}$ - $3\frac{1}{2}$ in. long, 8-12 lines thick, thickened in the middle, curved and attenuated at the base, a little shining; it seems hollow in old age; the flesh resembles that of the pileus. Odour a little pleasant.

Gills white, very numerous, slender, flabby, almost glutinous, forming a greasy pulp (1 line wide); they become thinner singularly on approaching the stem. They are veined at their base, straight, adherent and furcate about the stem.—*Secr. No. 522.*

Found in July.

R. chlorea. *Secr. No. 256.*

Pileus yellowish fawn, light, sides slate, in old age turning to greenish, smooth, dry. Its adult form is plane. Diam. $3\frac{1}{2}$ in. Flesh white, firm, 5-6 lines thick, margin deeply split.

Gills white, numerous, rather slender, straight, adnate, 3 lines

wide, especially bifid on attaining the stem, with many short gills.

Stem white, $2\frac{1}{4}$ in. long, 9 lines thick, straight, nearly of equal thickness, a little curved and pointed at the foot, which becomes reddish. Flesh full. Odour a little agreeable.—*Secr.* 526.

Under beech. End of June.

var. B. Pileus of a grey tint, with yellowish and greenish, shining, the gills convex, $3\frac{1}{2}$ lines. Stem swollen at the apex.—*Secr.* No. 526.

Undoubtedly *Russula heterophylla* has been constantly confounded with *R. cyanoxantha*, from which it is primarily distinguishable by the *very narrow* and more crowded gills. It is by no means a common British species. Badham's figures, and some others, clearly belong to *R. cyanoxantha*. It is hopeless to attempt to separate the two species in the descriptions given by the older authors.—*M. C. C.*

1214. *Russula (Heterophyllæ) galochroa.* *Fr. Hym. Eur.* 447. *Fr. Mon.* 195. *Sacc. Syll.* 1831. *Stevenson* II., 123. *Bull. t.* 509, f. L. *Cooke Hdbk.* II., 1214. *Cooke Illus. t.* 1089.

Smaller than *R. heterophylla*, pileus at first milk white, then becoming greenish, rarely with scattered floccose white spots.

Under birch.

Margin even, or slightly striate. Flocci of the disc spot-like or wart-like.—*Fr. Hym. Eur.* 447.

Chiefly in birch woods. Stem solid, firm, 1-2 in. long, $\frac{1}{2}$ in. thick, never becoming reddish. Pileus rather plane, viscid in moist weather, commonly dry, white, turning greenish, even, and sometimes sprinkled with floccose white spots, margin faintly striate. Gills rather thin, more or less furcate and unequal.—*Fr. Mon.* 195.

"The flocci at the disc, in the form of spots or warts, are not like those of *R. virescens*."—*Stevenson*.

Although not cited by Fries, the following is Secretan's description:—

A. galochrous. *Secr.* 535.

var. A. Pileus milk white, yellowish white, dull, convexo-plane, becoming plane, $2\frac{1}{4}$ in. diam., margin without striæ. Flesh white, 4 lines thick, firm, hard.

Gills white, changing to the eye to yellowish, slender, numerous, veined at the base, convex, adnate, 2 lines wide, a few short gills.

Stem white, 2 in. long, 6 lines thick, a little shining, curved, swollen at the foot, which ends in a point. Flesh same as the pileus. Odour indifferent.

var. B. Larger, presenting at the sides slight reddish tints, of a dull aspect.

var. C. Also larger, diam. 4 in., presenting a tint of reddish in the centre, margin a little folded. Gills white, numerous, "almost" pass for free. Stem straight, $1\frac{1}{2}$ in. long.—*Secr.* 535.

1215. *Russula (Heterophyllæ) consobrina.* *Fr. Hym. Eur.* 447. *Fr. Mon.* 195. *Sacc. Syll.* 1832. *Stevenson II.*, 123. *Cooke Hdbk.* II., 1215. *Cooke Illus. t.* 1055.

Very acid, pileus fleshy, rather fragile, expanded or depressed, flesh white, under the thick (moist), viscid pellicle cinereous, margin membranaceous, straight, even; stem spongy, stuffed, firm, white, becoming cinereous; gills adfixed, crowded, white, many dimidiate and furcate.

In larch woods.

Commonly broad, not fœtid, disposed towards the former, gills towards the latter approximating. Pileus at first campanulate, gills free, then as expanded, adnate, scarcely connected by veins, but this note is deceitful. Colour umber, olivaceous, fuscous, or grey, *Secr.* 519, 527-529, but a suspicion of admixture of *Russula rigides*.—*Fr. Hym. Eur.* 447.

Stevenson says, "Stature in general that of *R. emetica*, but differing in the colour of the pileus, and in the very unequal gills."

Amongst moss, in larch woods. Stem solid but soft, 2-3 in. long, 1 in. thick, equal, even, smooth, white, at length becoming cinereous. Pileus fleshy, fragile, campanulate, then expanded, at length depressed, 3 in. broad, dark cinereous or fuscous olive; margin patent, even, membranaceous. Flesh white, under the thick, viscid, separable cuticle cinereous. Gills at first free, then with the expansion of the pileus, apparently adnate, broad, crowded, white, many dimidiate and furcate. Taste very acid. Stature of *R. emetica*, but differing in colour and in very unequal gills.—*Fr. Mon.* 195.

The following are somewhat doubtful descriptions given by Secretan :—

R. viridigrisea. *Secr. No.* 519.

Pileus greenish grey, shining, viscid, the colour nearly uniform. It is plano-concave, centre depressed, margin folded in and at length straight, rather tuberculose and striate. Diam. 4 in. Often set obliquely on the stem. Flesh 6 lines thick.

Gills white, numerous, narrow, straight or convex, adnate, 4 lines wide, not at all veined at the base. Some short gills.

Stem white, shining, 3 in. long, 10 lines thick, thickened at the summit, attenuated at the base, and forming in the middle an angular thickening very remarkable, underneath which it comes again to narrow and bends itself. It is nearly solid and afterwards hollow. Odour feeble and a little agreeable. This plant, fleshy, heavy, is solitary.—*Secr.* 519.

R. luridus russula. *Secr. No. 527.*

Pileus olive brown at the margin, yellowish olive in the centre, approaching convex, more or less deformed, at length plane, centre depressed. Diam. $2\frac{3}{4}$. Flesh white, 4 lines thick.

Gills white, tending to yellow, especially at the margin of the pileus, numerous, crowded, fragile, 3-5 lines wide, straight, adnate, short gills anastomosing with the longer ones.

Stem white, shining, 2 in. long, 10-12 lines thick, swollen at the summit, compressed at the base, widened and rounded at the extremity, whole plant fleshy and firm.—*Secr. 527.*

Under firs.

R. fumosa russula. *Secr. No. 528.*

Pileus bistre by zones, margin turning bleached, the centre a little olive, an intermediary zone is darker, surface shining, without striæ. It becomes plane, centre depressed, set obliquely on the stem. Diam. $2\frac{3}{4}$ in. Flesh white, 4 lines thick.

Gills white, numerous, straight, 1 line wide, veined at the base, adnate. Here and there a short one.

Stem white, mealy, especially by the gills, $1\frac{3}{4}$ in. long, $6\frac{1}{2}$ lines thick, swollen at the summit, slightly ventricose, curved, and terminating in a point. Flesh white, attacked by insects. Odour not disagreeable. Solitary.—*Secr. 528.*

Under oaks.

R. consobrina. *Secr. No. 529. Paul. t. 75, f. 1-5. Batsch. f. 6-7.*

Pileus slate grey, dull, darker in the centre when large, bleached at the margin. In youth the margin is more white and the centre punctate with black. It is convex, with the centre depressed, at length concave, margin splitting like a star, sometimes set obliquely on the stem, margin not striate. Diam. $2\frac{1}{2}$ in. Flesh white, 4 lines thick.

Gills white, becoming a little yellowish in desiccation, numerous, slender, 3 lines wide, their form following the contour of the pileus. A small number furcate, arriving at the stem they are very much veined and as if branched, they are stopped at the same level, and seem attached by a point.

Stem white, reddish at the foot, $1\frac{1}{2}$ in. long, 9 lines thick, straight, swollen at the two extremities, rounded at the base. Flesh destroyed, becomes hollow.

Under firs.

var. B. The centre darker, is encircled by a zone of light orange and mixed; this rather large zone is especially terminated by a darker hue, which is not very distinct; the rest is slate grey, mixed and whitened. Surface dry, a little shining. Finally, the centre takes a very light reddish yellow, encircled by confused zones of dark flesh colour, more remote dark brown and light grey at the margin. The pileus is plane, deformed, depressed at the centre.

Diam. 3 in. Stem white, $1\frac{1}{4}$ in. long, 10 lines thick, inflated at apex, compressed, curved, and attenuated at the foot. Firm and dry.—*Secr.* 529.

var. *sororia*. *Fr. Hym. Eur.* 447. *Stevenson* II., 124. *Cooke Hdbk.* II., 1215. *Cooke Illus. t.* 1057. *Fries Icon. t.* 173, f. 1. *Larbr. t.* 19, f. 7.

Pileus convex, then plane or depressed, *margin striate*, gills rather distant, connected by veins.

In pine woods.

Habit and colour the same, but differing in many points. Stem white, gills with many dimidiate but few furcate.—*Fr. Hym. Eur.* 447.

var. *intermedia*. *Cooke Illus. t.* 1056. *Cooke Hdbk.* II., No. 1215.

Pileus fleshy, depressed, viscid, margin thin, striate; stem usually attenuated downwards, becoming cinereous and striate; gills dirty white.

On the ground under trees.

This resembles *sororia* in the striate margin, differs in the cinereous, striate stem. From *consobrina* it differs in the striate margin, but resembles it in the cinereous stem.—*M. C. C.*

SPORES subglobose, 10 μ diam.

1216. Russula (Heterophyllæ) fœtens. *Pers. Syn. p.* 443. *Fries Mon.* 195. *Fr. Hym. Eur.* 447. *Fr. Sver. Svam. t.* 40. *Sacc. Syll.* 1833. *Krombh. t.* 70, f. 1-6. *Bull. Champ. t.* 292. *Venturi t.* 33, f. 1-3. *Viviani t.* 41. *Sow. t.* 415. *Stevenson* II., 14. *Cooke Hdbk.* II., 1216. *Cooke Illus. t.* 1046.

Acrid, fœtid, pileus bullate, then expanded and depressed, *rigid*, adnate pellicle viscid, disc fleshy, margin broad, membranaceous, at first turned in, tuberculose-sulcate, stem stout, stuffed, then hollow, gills adnexed, *unequal, and furcate*, veined and anastomosing, whitish, at the first weeping.

In woods. Common.

Large, very rigid, with a very deep empyreumatic odour, soon distinct, pileus at length reflexed and repand. Gills (at first free) thin, obsoletely yellowish, dirty when bruised.—*Fr. Hym. Eur.* 447.

In woods, etc., everywhere common. Large, in a manner rigid, with a heavy empyreumatic odour. Taste *acid*. Stem stout, stuffed, then hollow, 2 in. and more long, $\frac{1}{2}$ -1 in. thick, whitish. Pileus slightly fleshy, at first bullate, then expanded and depressed, pellicle adnate, not separable, in moist weather viscid, 4-5 in. and more broad, dingy yellow, sometimes growing pale, margin broadly membranaceous, and long sulcate, the ribs at length tuberculose, at first inflected. Flesh thin, rigid-fragile, pallid; gills adnexed, crowded, connected by veins, mixed with many dimidiate and furcate, whitish, at first weeping watery drops, by which it differs from all the preceding. In dry weather the odour sometimes obsolete.—*Fr. Mon.* 196.

SPORES.—8 μ (W. G. S.); 9-12 \times 7-9 μ (Britz.); 8 μ (Bizz.); 8 μ diam., or 9-10 \times 7-8 μ (Sacc.).

For this common species Fries cites Secretan, No. 530.

R. foetens. *Secr.* No. 530. *Bull.* t. 292.

Pileus in early infancy yellowish white, then passes to dark yellowish grey, or yellow ochre leading to orange; brown in the centre, and a lighter tint at the margin, coloured brownish. In old age the margin is like golden. It is viscid; in infancy it is globose, the margin bumped and firm, in a sinuous contour; afterwards it becomes plane, humped, and a little raised in the centre. Finally it is concave, margin turned in, and channelled, whose back is tuberculose. Diam. 6 in. Flesh white, 5 lines thick.

Gills yellowish white, not very numerous, slender, entire, fragile, veined at the base, much anastomosed, especially by the stem; they are straight, and finally convex, joined one to the other by a point which adheres to the stem. This junction is produced by a bifurcation which terminates each gill, the bifurcation in form of two threads, which amalgamate one neighbour to part of the other. The front of the gills is prolonged in fine striæ on the stem. Width of gills 4-5 lines. When touched they are spotted with brown.

Stem white, dull, of yellowish tints, $3\frac{1}{2}$ in. long, $1\frac{3}{4}$ in. thick, straight, narrowed at the summit, a little thickened in the middle, and terminated in a point. Flesh often devoured by slugs, then appears hollow. In old age it is covered with long greyish fibrils. The odour is certainly foetid.—*Secr.* 530.

var. B. Pileus approaches dull white, then turning to a yellowish red, shining. It is some time concave, the margin straightened, unequally striate and tuberculose in old age. Diam. 2 in. Flesh white, 2 lines thick.

Gills white, turning at length yellowish, straight, arrested at the same level, 2 lines wide, fragile, short gills rarely.

Stem a little reddish, charged with white lines, 2 in. long, 4 lines thick, deformed, swollen at the base. The interior is destroyed by insects. All the plant is very fragile. Odour foetid.—*Secr.* 530.

Agaricus foetens. *Pers. Eng. Fl.* v., 22.

Gregarious. Pileus 4-5 in. broad, at first convex, the margin broadly folded inwards, convex, at length more or less depressed, with the margin somewhat vaulted, fleshy in the centre, the margin thin, furrowed, and tubercled, the striæ appearing as if a glutinous membrane were stretched over them, dirty yellow, rather brittle. Gills forked, dirty white, or yellowish, moderately broad, connected by veins. Stem 3-4 in. high, above 1 in. thick, obtuse, incrassated at the base, ruggedly hollow within, as if eaten by snails, white or with a dirty yellow tinge, depresso-tomentose; beneath the gills minutely pitted longitudinally, flesh rather yellow. Highly acrid, odour very strong and penetrating, empyreumatic, somewhat resembling that of prussic acid, but exceedingly disagreeable.—*Berkeley.*

This is a very common species, and not easily to be confounded with anything else. We have met with specimens without any peculiar odour, and also occasionally others which were decidedly fragrant, with a suggestion of melilot. As we have submitted the latter to the judgment of others who have been with us at the time, and they coincided with us, there can be no suspicion of error as to the odour.—*M. C. C.*

1217. *Russula subfætens.* *Smith Journ. Bot.* 1873, 337. *Cooke Hdbk.* II., 329. *Cooke Illus. t.* 1047. *Sacc. Syll. No.* 1834. *Stevenson II.*, 124.

Pileus bullate, rather viscid, disc fleshy, margin submembranaceous. Stem not stout as in *R. fætens*, and smaller. Gills thick, distant, and branched. Odour unpleasant, taste rather acrid.

On the ground.

Stevenson says :—"Pileus bullate, somewhat viscid, disc fleshy, margin somewhat membranaceous. Stem not stout; gills thick, somewhat branched."—*Stevenson II.*, 124.

Stevenson says also :—"This is the plant referred to by Fries, *Syst. Myc.* I., p. 58, as a var. of *R. fragilis*," but this is doubtful, and much more probably *R. citrina* of Gillet.

Stevenson gives the derivation of the name as "*sub* and *fætens*—somewhat stinking," but this was not the meaning attached by W. G. Smith, who intended it as "approaching *R. fætens*."

Saccardo calls the gills "*tenuibus*" in error, whereas Smith describes them as *thick*. The whole plant is tough and elastic, and the gills are weeping in moist weather, and when young. Certainly *Russula simillina* (Peck) must strongly resemble it. In all the specimens that we have met with the odour has been very faint and sometimes none at all.—*M. C. C.*

1218. *Russula (Heterophyllæ) fellea.* *Fr. Hym. Eur.* 447. *Fr. Mon.* 196. *Fr. Icon. t.* 173, *f.* 2. *Sacc. Syll.* 1837. *Stevenson II.*, 125. *Paul t.* 76, *f.* 4. *Cooke Hdbk.* II., 1218. *Cooke Illus. t.* 1058.

Very acrid, pileus fleshy, thin, convexo-plane, polished, opaque, not growing pale, margin even, at length striate, *flesh firm*, stem spongy, stuffed, then hollow, even; *gills* adnate, crowded, subequal or bifid behind, all whitish, then *straw-coloured*.

In beech woods.

Is very distinct from all other species in being wholly straw-colour, but the pileus is often darker, passing into gilvous; pellicle not separable. Gills narrow, weeping in wet weather.—*Fr. Hym. Eur.* 447.

In beech woods this species is common.

A small species, noble, very acrid, with no others easily confounded. Odour none. Stem spongy-stuffed, hollow, fragile, 2 in. long, $\frac{1}{2}$ in. thick, equal, even, white, then straw-colour. Pileus thinly fleshy, convex, then plane, 1-2 in. broad, polished

smooth, glivous straw-colour, disc darker; margin even, when exolete faintly striate. Pellicle of the pileus closely adnate, thin; flesh of the colour of the gills. Gills adnate, crowded, thin, narrow, obsoletely connected by veins, mixed with a few dimidiate or furcate behind, straw colour. Also in this the gills in moist weather weep drops of water.—*Fr. Mon.* 196.

Fries quotes Secretan No. 501 under this species.

R. fellea. *Secr. No.* 501.

Pileus straw yellow, of an uniform tint, the margin browning in extreme old age. It is a long time plane, sometimes a little umbonate, ordinarily rather regular, orbicular, the margin straight, thin, without striæ except in extreme old age. Diam. $2\frac{1}{4}$ in.; it becomes concave. Flesh yellowish, 3 lines thick, firm.

Gills white, then yellowish, numerous, straight or convex, adnate, slender, fragile, some furcate near the stem, $1\frac{1}{2}$ lines wide, very few or no short gills.

Stem yellowish white, dull, $1\frac{3}{4}$ in. long, 6 lines thick. Straight, a little augmented above, and narrowed towards the base, which ends in a point. Flesh yellowish, firm. Odour a little agreeable. Taste acrid, burning.—*Secr.* 501.

In mixed woods.

1219. Russula (Heterophyllæ) elegans. *Bres. F. Trid., p.* 21, *t.* xxv. *Sacc. Syll.* 1838. *Cooke Hdbk.* II., 1219. *Cooke Illus. t.* 1027.

Pileus fleshy, thin, convex, then rather depressed, margin when adult tuberculose striate, viscid, bright rosy flesh colour, soon the circumference suffused with ochraceous, wholly densely granulate, 3-5 c.m. diam. Gills attenuate behind, adnexed, or slightly rounded, very much crowded, equal, rarely somewhat furcate, whitish, when mature entirely or here and there bright ochraceous; orange stem, spongy, then stuffed and lacunose, hollow, somewhat thickened at the base, white, ochraceous below, rather rugulose, 3-5 c.m. long, 1 c.m. thick; flesh white, when old ochraceous, acrid. Spores sphaeroid, beautifully echinulate, uniguttulate, whitish in heaps, greenish hyaline under microscope, 8-10 μ , basidia clavate, 20-25 \times 8-10.—*Bresadola*.

In moist woods.

SPORES 8-10 μ diam. (Sacc.), 10 μ (G. M.).

1220. Russula (Heterophyllæ) Queletii. *Fr. Hym. Eur.* 448. *Sacc. Syll.* 1839. *Stevenson* II., 125. *Cooke Hdbk.* 1220. *Cooke Illus. t.* 1023. *Quelet Jura t.* 24, *f.* 6.

Acrid, pileus compact, campanulate, convex, then plane, even, viscid, dark violet or fuscous, margin slightly striate, purplish lilac; stem spongy, farinose, purple violet; gills attenuated, unequal, or furcate, weeping, white.

In pine woods. Spring.

Flesh firm, white, purple red under the cuticle. The drops on the gills when dry leave bluish grey or pale blive spots.

"Easily distinguished from *R. integra* by the white gills."—*Stevenson*.

It is sometimes suggested that the three species called respectively *R. Queletii* (Fries), *R. expallens* (Gillet), and *R. drimeia* (Cooke) are but forms of one species, but with this we are not disposed to agree. There is a superficial resemblance in form, size, and colour, but there the resemblance ends. *R. Queletii* has white weeping gills, but those of *R. expallens* are pale yellowish, and those of *R. drimeia* sulphur-coloured from the first, besides other differences which become evident on comparison. Of the three *Russula Queletii* and *R. expallens* are most nearly allied, but the other does not belong to the same section.—*M. C. C.*

1221. *Russula (Heterophyllæ) expallens.* *Gill. Tab. Champ. p. 49. Sacc. Syll. No. 1840. Cooke Hdbk. II., 1221. Cooke Illus. t. 1029.*

Pileus fleshy, firm, somewhat depressed, viscid, bright purple, centre dark purple (6-8 c.m. diam.), at length, except the disc, discoloured, cuticle separable, flesh purple, stem cylindrical, firm, equal, or a little incrassated about the base, 5-8 c.m. long, 2 c.m. thick, becoming purplish, mealy; gills pallid yellow, furcate at the base, broad.

Under trees.

Obs. Gillet thinks that *R. drimeia* (Cke.) is the same species, which can hardly be the case, as that does not become discoloured, the flesh is not purple, and the gills are lemon-coloured from the first. Perhaps *Russula fragilis*, Krombh., t. 64, fig. 14-18, may be this present species.—*M. C. C.*

NEGLECTED DIAGNOSES.

By M. C. COOKE.

***Camarops quercicola*, B. & Cooke.** = *Entypa quercicola*, *Berk. in Herb. No. 8808.*

Stromate cortice innato substantia formato. Peritheciis gregariis, subglobosis, immersis, prominulis, pertusis. Ascis clavatis, longe stipitatis, octosporis. Sporidiis lanceolatis, uniseptatis, medio constrictis, fuscis, $20 \times 4 \mu$.

On bark of *Quercus*. N. Carolina. (741.)

***Sphæria cavernosa*, Mont. in Herb.**

On *Viburnum*.

Sporidia same as in *Aglaospora profusa*.

***Valsaria spurca*, B. & C.** = *Sphæria spurca*, *Berk. & Curt. in Herb. Berk.*

Pustulate, covered by the epidermis, which is at length pierced. Asci clavate, sporidia elliptical, uniseptate, brown, slightly constricted, with a thick, hyaline epispore, $25-30 \times 8-10 \mu$.

On bark. United States. (*Murray*.)

Valsa (Chorostate) biconica, *Currey Linn. Trans.* xxii., fig. 142.

Sporidia uniseptate, greenish, biconical, $28-30 \times 8 \mu$.

Sphæria Phœnicis, *DR. & Mont.*

Apparently the same as *Anthostomella contaminans*, *DR. & M. Sacc. Syll.* 1035.

On palms. Algeria.

Melanopsamma buxiformis, *B. & C.* = *Sphæria* (*Pertusæ*) *buxiformis*, *B. & Curt.*

Perithecia scattered, erumpent, rather small, innate at the base, depressed above, smooth, black. Asci clavate. Sporidia biserial, elongated-elliptical, uniseptate, not constricted, hyaline, $22-26 \times 8 \mu$.

On naked wood. Cuba. (888.)

Sphæria biordinata, *Berk.*, on wood, Cuba, 886, hardly appears to be distinct.

Physalospora asbolæ, *B. & Br.* = *Sphæria asbolæ*, *B. & Br. in Herb.*

Gregarious. Perithecia innate, covered, small, globose, black, pierced. Asci clavate. Sporidia elliptical, continuous, hyaline, $18-20 \times 10 \mu$, granular within.

On palms. Ceylon. (307.)

Endoxyla lineata, *Fr.* = *Sphæria lineata*, *Fr. S. M.* II., 373.

Sporidia allantoid, $8-10 \mu$ long.

Specimen from Schweinitz.

Didymella psoriella, *B. & C.* = *Sphæria psoriella*, *B. & C. in Herb.*

Gregarious or scattered, perithecia innate, elevating the cuticle, globose, black, pierced; asci clavate, octosporous; sporidia elliptical, then a little compressed towards each end, and shortly lanceolate, uniseptate, constricted, each cell binucleate, hyaline, $25 \times 8 \mu$.

On *Platanus*. Carolina. (2130.)

Didymella uberiformis, *Schw.* = *Sphæria uberiformis*, *Schw. Amer. Bor.* 1665, *nec. Fries.*

Erumpens, corticola, sparsa. Peritheciis semi-immersis, prominulis, atris, ostiolo crasso, conico. Ascis clavatis, sporidiis lanceolatis, uniseptatis, 18μ long.

On bark of *Betula*. Bethlehem.

Didymella rubitingens, *Blox.* = *Sphæria rubitingens*, *Bloxam in Herb. Berk.*

Perithecia erumpent, soon naked above and conical, immersed at the flattened base, staining the matrix purplish red, smooth, shining, black. Asci clavate, sporidia lanceolate, uniseptate, a little constricted, each cell biguttulate, $20 \times 7 \mu$, hyaline.

On herb stems. Gopsall. (*Bloxam.*)

Didymosphæria tecomatis, *Berk. & Curt.* = *Sphæria tecomatis*, *B. & C. in Herb.*

Caulicola, sparsa, tecta. Peritheciis innatis, minutis, subglobois, papillatis, atris; ascis clavatis, octosporis; sporidiis elliptico-fusiformibus, biserialibus, uniseptatis, fuscis, $10-12 \times 4 \mu$.

On *Tecoma radicans*. Carolina. (4947.)

Sphæria micheneri, B. & C. in *Herb.*, from Pennsylvania (6038), apparently the same thing, with the sporidia immature.

Metasphæria rubida, Blox. = *Sphæria rubida*, *Bloxam in Herb. Berk.*

Caulicolous. Perithecia rather small, globose, black, with a papillate ostium, at first covered by the cuticle, but at length exposed. The matrix stained with a purple-red colour, which is partially discharged with moisture. Asci clavate. Sporidia fusiform, straight or curved, 3-5 septate, constricted, hyaline, $25 \times 3 \mu$.

On herb stems. Twycross. (*Bloxam.*)

Thyridaria crocosarca, B. & Br. = *Melogramma crocosarca*, B. & Br. in *Herb.*

Erumpent. Perithecia saffron colour, mealy, caespitose, 2-6 together, often confluent, on a narrow stroma, pierced at the apex, forming clusters 2 m.m. long. Asci clavate, octosporous. Sporidia fusiform, 7-11 septate, pale, not constricted, $40 \times 12 \mu$, with linear paraphyses.

On bark. Ceylon. (*Thwaites* 131.)

Sphæria rhodoglea, B. & Curt. in *Herb.*

This is partly a *Phoma* and partly a *Rhabdospora*, with filiform sporules, 30-35 μ long.

On *Negundo*. Carolina. (6353.)

Sphæria berchemiæ, Berk. & Rav. in *Herb.*

No asci seen, only brown stylospores, 3-5 septate, $20-25 \times 5 \mu$, probably a *Hendersonia*.

On *Berchemia volubilis*. S. Carolina. (613.)

Sphæria radiella, B. & C. in *Herb.*

On *Morus multicaulis*. U.S.A. (4808.)

This is merely *Nectria Russellii*, B. & C., with the sporidia just commencing to be formed.—Sacc. Syll. 4668.

Pyrenophora lanuginosa, Sacc. Syll. 3867.

To this species is probably to be referred *Sphæria Ravenelii*, B. & C. (*Sphæria comata*, Tode).

On dead culms of grasses, from Santee Canal, S. Carolina. (1413.)

Dimerosporium aterrimum, Cke. & Wint.

Epiphyllum. Maculis orbicularibus gregariis, aterrimis, velutinis (5 m.m. diam.), filis flexuosis, plerumque simplicibus, opacis. Peritheciis subglobosis vel irregularibus, astomis, ascis ovoideis; sporidiis arete ellipsoideis, immaturis.

On coriaceous leaves. Manipur, India. (*Watt* 7463.)

Asterina Darwini, Berk. Fl. Antarc. 454.

Seems to be the same as *Asterina Azaræ*, Lev. Sporidia uniseptate, $15 \times 4 \mu$.

On *Azara lanceolata*. Cape Tres Montes. (*Darwin.*)

The following specimens we have either been unable to examine, or, having done so, have discovered no fruit.

Valsa asimilis, Ces. Born.

On bark. Pulo Penang.

Sphæria Bertiana, De Not.

On bark. Allied to *S. umbrina*.

Sphæria Bromeliæ, Schwz.

On *Bromelia* leaf. Surinam.

Sphæria complexa, Mont.=*Diatrype* or *Valsa*?

On bark. France.

Sphæria constipata, Mont.

On *Smilax aspera*. Aix.

Sphæria (confluente) Cratægi, Schw. Amer. Bor. 1445.=*Valsa*.

Perithecia 5-6 in a circle, necks convergent in the centre.

On *Cratægus*. Bethlehem.

Sphæria Curtisii, Berk. MS.

On nuts of *Carya*. Carolina.

Sphæria dipsaci, Cast.

On *Dipsacus*. France.

Sphæria disseminata, Schwz. Am. Bor. 1730.

On herbs. N. America.

No fruit, probably a *Phoma*.

Sphæria epitephra, B. & Curt.

On *Platanus*. Carolina.

Sphæria faginea, Pers. Fr. Scler. Suec. 262.

On bark of *Fagus*.

Sporidia elliptical, brown.

Sphæria flavitecta, Berk.

On *Pteris*. Meudon.

Sphæria inconspicua, Currey.

=*Diaporthe*.

Sphæria juglandis, Bloxam.

Valsoid. Sporidia biseriata, narrow, elliptical, resembling *Phoma* spores.

On walnut bark. Britain.

Sphæria Kurzii, Berk.

On *Metroxylon*. Java.

Sphæria loniceræ, Cast., nec. Fries.

On *Lonicera*. France.

Sphæria menispermi, Pers.

On *Menispermum Canadensis*. Paris.

Sphæria micrographa, Fries in litt.

Ex herb Montagne.

Sphæria microstigma, Mont.

On *Hemerocallis lutea*. France.

Sphæria monogramma, Mont.

On *Equisetum*. Ex Castagne.

Sphæria nigrificans, N.

On leaves.

Sphæria olivacea, Currey.

On bark. Britain.

Sphæria oxystoma, Pers.

On twigs. Sedan. (Herb Montagne.)

- Sphæria patella** (*Fries*), *Schw. Am. Bor.*
On *Pastinaca*. Only a *Phoma*.
- Sphæria penicillus**, *Pers.*
On oak branches.
- Sphæria phlyctis**, *DR. & M.* (Entypella).
On vine twigs. Algeria.
- Sphæria plinthis** (*Fries*), *Schw. Amer. Bor.* 1725.
On herbs.
- Sphæria porri**, *Schw. Amer. Bor.* 1460.
On *Allium*. Bethlehem.
- Sphæria rubi**, *Cast.*
On *Rubus* stems. Aix.
- Sphæria tomentosa**, *Currey*.
On bark. Britain.
- Sphæria xanthoderma**, *Link.*
On trunks. Brazil.
- Sphæria barbatula**, *B. & Curt.* = *Hypoxylon investiens*, *Schwz.*

SPHÆRIACEÆ IMPERFECTÆ COGNITÆ.

In order to aid in practically reducing this "appendix" in Saccardo's Sylloge still further than has already been done, we have examined specimens from the Herbarium of Schweinitz chiefly in the Berkeley Herbarium, with the following results:—

- 4227. Nectria atrofusca** (*Schw.*). *Sphæria atrofusca*, *Schw. Amer. Bor.* 1429.

Asci clavate, stipitate, sporidia elliptical, uniseptate, hyaline, $10-12 \times 4 \mu$.

- 4321. Diplodia semitecta** (*Fries*). *Sphæria semitecta*, *Fries.* (*Sphæria panacis*), *Fries Scler. Suec.* 319.

Sporules elliptical, uniseptate, scarce constricted, dark brown, $22-25 \times 8 \mu$.

- 4326. Phoma pericarpium** (*Schw.*). *Sphæria pericarpium*, *Schw. Amer. Bor.* 1590.

Sporules minute, hyaline.

- 4328. Phoma glandicola** (*Schw.*). *Sphæria glandicola*, *Schw. Amer. Bor.*

Sporules $5 \times 3 \mu$, basidia $20 \times 3 \mu$.

- 4332. Phoma surculi** (*Fr.*). *Sphæria surculi*, *Schw. Amer. Bor.* 1583.

- 4348. Sphæria obtectæ**, *Schw.*

This appears to be ascigerous, but the asci are immature.

- 4351. Sphæria rhoïna**, *Schw.*

This is not a *Sphæria*, there are no asci. The sporules are elliptical, continuous, with a large central guttule, $20 \times 8 \mu$.

- 4361. *Diplodia conspersa* (Schw.).** *Sphæria conspersa*, Schw. Amer. Bor. 1663.

Sporules narrowly elliptical, uniseptate, brown, $14 \times 6 \mu$.

- 4372. *Sphæropsis ampelos* (Schw.).** *Sphæria ampelos*, Schw. Amer. Bor., 1637.

Sporules elliptical, continuous, brown, $10-12 \times 6 \mu$.

- 4374. *Phoma pyrina* (Fries).** *Sphæria pyrina*, Fr. S. M. II., 494.

Sporules hyaline, $6 \times 3 \mu$.

- 4375. *Phoma erumpens* (Schw.).** *Sphæria erumpens*, Schw. Syn. Car. 209.

Sporules minute, linear, oblong, $4-5 \times 2 \mu$.

- 4387. *Physalospora obtusa* (Schw.).** *Sphæria obtusa*, Schw. Amer. Bor. 1688.

Asci clavate, sporidia lanceolate, hyaline, $35-40 \times 9 \mu$.

- 4383. *Physalospora padina*, Fries.** sub-*Sphæria*.

Sporidia elongated-elliptical, biseriate, hyaline, continuous, then quadriguttulate, $20 \times 8 \mu$.

Specimen from Mougeot.

- 4384. *Diplodia ruborum* (Schw.).** *Sphæria ruborum*, Schw. Amer. Bor. 1677.

Sporules uniseptate, constricted, brown, $20 \times 8 \mu$, possibly not distinct from *D. rubi*.

- 4385. *Sphæropsis pomorum* (Schwz.).** *Sphæria pomorum*, Schwz. Amer. Bor. 1683.

Sporules 24μ long.

Probably the same as *Sphæropsis malorum*, Peck., Sacc. Syll. No. 1647, of which *Phoma malorum*, Berk., Sacc. Syll. 903, is possibly an earlier condition.

- 4390. *Sphæropsis druparum* (Schwz.).** *Sphæria druparum*, Schwz. Amer. Bor. 1682.

Sporules continuous, 25μ long.

It is doubtful whether distinct from *Sphæropsis pericarpii*, Peck., Sacc. Syll. 1680, or *S. Caryæ*, C. & E., Sacc. Syll. 1681.

- 4391. *Phoma capsularum* (Schwz.).** *Sphæria capsularum*, Schw. Amer. Bor. 1681.

Sporules straight or curved, binucleate, 8μ long.

- 4393. *Teichosporella azaleæ* (Schw.).** *Sphæria azaleæ*, Schw. Amer. Bor. 1685.

Asci clavate, sporidia fusoid-elliptical, obtuse, murali-cellular, hyaline, $25 \times 10-12 \mu$.

- 4403. *Rhabdospora jasmini* (Schw.).** *Sphæria jasmini*, Schw. Amer. Bor. 1704.

Sporules filiform, curved or straight, 22μ long.

- 4415. *Phlyctaena tecta* (Schw.).** *Sphæria tecta*, Schw. Amer. Bor. 1731.

Sporule filiform, hamate at the tips, $25-30 \mu$ long.

- 4423. *Metasphæria obtusata* (Schw.).** *Sphæria obtusata*, Schw.
Amer. Bor. 1737.

Asci clavate, stipitate; sporidia lanceolate, 5-7 septate, $50 \times 7 \mu$ hyaline.

- 4426. *Macrophoma meloplaca* (Schw.).** *Sphæria meloplaca*, Schw.
Amer. Bor. 1753.

Sporules elliptical, hyaline, $20 \times 10 \mu$.

- 4433. *Phomatispora echinophila* (Schw.).** *Sphæria echinophila*, Schw. *Amer. Bor.* 1755.

Asci cylindrical, sporidia uniseriate, narrowly elliptical, hyaline, $6 \times 2 \mu$.

BACTERIA IN PLANT DISEASE.

For some time it has been suspected that microbes have something to do with certain obscure diseases of plants. These suspicions seem to be developing themselves almost into certainties, and to present another curious analogy between the diseases of animals and plants. The disease known in the United States as "Peach yellows" has constantly evaded all search for mycelium, or trace of fungoid development, and yet it is a destructive and insidious foe. Professor Burrill made investigations in 1888 and 1889, but without any decided results. Nevertheless he reports that "he had found in the tissues of the root and of the old and young stems of diseased trees an organism classed with the bacteria, which is not known to occur elsewhere. This organism has been frequently obtained by methods of culture under circumstances which preclude the possibility of its coming from anything except the inner cells of the tree. He had it growing in artificial media, and it exhibited all the peculiarities of a pathogenic rather than a saprophytic microbe. It had peculiarities which served to distinguish it from all others of its kind, and he was convinced it had never before been described by anyone. He found it in every set of specimens examined known to be affected with this disease, and had thoroughly tried in the same manner to find it in healthy stock and failed." Still further he says, "If the disease is really due to the microbe mentioned the malady differs widely from that of any heretofore described bacterial injury to living vegetation. The microbe must be sparsely, but widely, distributed through the still living tissues of the tree, in which it must very slowly develop without causing evident local disturbance. This latter especially is entirely at variance with known effects of parasitic organisms. But we know that the peach tree affected with this disease very gradually succumbs, lingering along several years without local injury of pronounced type."*

On the subject of the California vine disease, Mr. Pierce, a special agent sent to investigate the disease, states that yellow

* Report of the Secretary of Agriculture, U.S., Section of Vegetable Pathology for 1889, p. 423.

spots occur on the leaves, which showed no trace of insects or fungi. That "the peculiar appearance and location of these spots led to a careful study of the same, which resulted in finding bacteria-like bodies in large numbers within the chlorophyllose cells of the spongy parenchyma immediately surrounding the spiral vessels supplying that region. After a long series of observations made on material from various portions of the diseased districts, which in no case failed to disclose the diseased vines as swarming with these bodies in all portions where sap had a ready flow, he believed it proper to undertake a series of experiments to determine if these bodies always present bore any relation to the disease as a whole. He had little doubt that they were micro-organisms, and gave to the local spotting of the leaves their characteristically sharp outline. Cultures from various parts of the vine were made in agar-agar and other media. Three sorts of bacteria were found with enough constancy to warrant further study, but he had not so far been able to determine whether any of these were the cause of the disease. In view of the fact that several Italian students have for years claimed that an Italian disease of similar characteristics is caused by bacteria, it is proper the matter should be decided if possible."*

It is established then, beyond doubt, that bacteria inhabit the tissues of plants in great numbers, that they appear to be of kinds peculiar to those plants, and may, or may not, be the cause of some of the plant diseases. To carry on the subject still further we must refer to a series of investigations on a disease of melons, and, by the results of these investigations, exhibit a very strong presumption that microbes are the cause of some diseases of plants.

"The attacked vines varied somewhat in their appearance, but generally there is a decay of the stem in proximity to the root, and then the whole plant wilts and fails to grow. Sometimes one or more leaves will fall to the ground, and rot away, before the balance of the plant is seemingly affected."

Dr. Byron Halsted reports† that "a microscopical examination of the decaying stems, leaves, and fruit showed that the decomposing tissues were teeming with bacteria. Inoculations of healthy fruits were made in the usual way, taking the germs from the centre of freshly-decaying cucumbers. It was found that with no other fungus present these germs were abundantly able to introduce a rapid decay into cucumbers, melons, and squashes. Cucumbers seem to be the favourite, and in them the decay is the most rapid. It will run from one end to the other, through the succulent centre of a four-inch fruit, in a single day.

"The next step in the study was the application of these germs to healthy plants in the field. When the inoculation was made near the end of a vine the latter rotted away in from three to four days, and when nearer the base a longer time was required, but in

* Report for 1889, p. 427.

† "Botanical Gazette," Nov., 1891.

all cases an ulcer was formed which spread more or less rapidly, depending upon the tissue infected. In old stems the decay was almost entirely internal, and did not show much until the disease had spread through the pith to some distant soft parts. A medicine dropper was employed to place a charge in the middle of several petioles of large squash leaves. Upon the next visit, twenty-four hours after, all such leaves had fallen to the ground, and the portion of the petioles below the point of inoculation, six or more inches in some cases, were thoroughly decayed. In short, the bacterial disease first found in the cucumber, and afterwards propagated from fruit to fruit in the laboratory, as also upon cut stems and petioles, is readily transmitted to vigorous living vines of the cucumber and squash in the field." Sixteen seeds of squash were divided, and eight planted in a pot covered with a bell glass, watered with pure water, whilst eight in another pot were watered from the first with the juice of a cucumber which had decayed with bacteria. The first eight seeds germinated quickly, producing large, deep green plants; while in the other pot only two plants appeared above ground, and they were of a dwarfed, sickly yellow colour, and did not continue to grow. The remaining six seeds, when removed from the soil, were decayed and noisome.

In another experiment eight seeds were placed on blotting paper, moistened with distilled water, and covered. A duplicate set were similarly watered with a solution containing bacteria from a decaying cucumber. The first series all germinated with their usual vigour, while those which came in contact with the bacterial germs failed to germinate, and soon decayed.

"The pure virus was next introduced into the growing stems and green fruits of the tomato, and in both cases quickly produced a decay that caused the stems to fall and the fruit to become a watery mass enclosed by the skin, similar to the cucumber from which the bacteria were taken for inoculation. At the time of the experiment some boxes of young tomato plants were close at hand, and into the centre of one of these a decaying cucumber was placed. In six hours some of the stems of the tomato plant, six inches in height, had rotted off close to the ground, where the liquid from the decaying fruit had come in contact with the young plants. In ten hours all the plants in the vicinity of the decaying cucumber were destroyed."

This account seems to be rather conclusive, especially when independently and collaterally supported by evidence given by other observers, in respect to other plants, having similar results.

NOTES ON EDIBLE FUNGI.

We have just received an interesting communication from a fungus-eating correspondent in the United States, and desire to quote a few extracts, which may be of interest to mycophagists on this side of the Atlantic. He writes that "the present season has been an exceptionally good one for 'toadstools.' I have

increased my list of edible varieties to over three hundred. All of these have been thoroughly tested by myself. I am able to assert, positively, from having eaten full meals of them often, that *Russula emetica* is as good as any *Russula*; that many of the spring varieties of *Russula*, sweet in the spring, are as peppery as the *emetica* when they grow in the autumn."

"Both *Agaricus epixanthus* and *Agaricus fuscicularis* are excellent. The *Boletus satanas* is one of the very best of the *Boleti*.

"For some years I have been delving into the mystery of propagation from the spores of the wild species, and have met with but little success. While I feel assured that I have the secret of growing *Cantharellus cibarius* from the spores, I am only certain that I can grow the *Agaricus procerus*. My researches convince me that, as the spores of *Agaricus arvensis* and *Agaricus campestris* are fecundated while in the digestive apparatus of the horse,* and that the fertilized spores are scattered and buried in our pastures from horse-droppings, by a common black beetle ('tumble bug') the spores of the *Russulae* and many other varieties have to pass through the system of insects that prey upon them before they will propagate their kind. I do not think any process will grow any variety of the *Agaricini* or *Boleti* (except *A. procerus*) before the spores have passed through some insect or animal, in which the impregnation of the spores occurs. *Lycoperdon giganteum* comes within this belief.

"My experiments tell me that many varieties of edible and non-edible fungi can be propagated from the mycelium, but the habitat of the species must be religiously observed and maintained."

There are some remarks in the above quotations which we would like to see confirmed before we place implicit faith in them, especially the fertilization of spores in some animal or insect host. As to the growth of *Agarics*, and even of *Lycoperdon*, from mycelium we have been convinced by experience. By the accumulation of facts we shall come near the truth--some day.—*M. C. C.*

NEW EXOTIC FUNGI.

By M. C. COOKE.

Polystictus (Discipedes) nigrescens, Cooke.

Pileo submembranaceo, plano, reniformi, lævi, glabro (5-10 c.m. diam.), fuligineo-nigrescente, postice in stipitem brevem disciformi producto, margine acuto, subfissili, poris brevissimis, minutis, rotundatis, æqualibus, fusco-nigricantibus. Contextu pallido.

On trunks. Brazil. (*Glaziou*, 18,767.)

Hydnum stereoides, Cooke.

Pileis membranaceo-coriaceis, numerosis, imbricatis, stipatis,

* And this has been as strongly denied.

rufo-brunneis, dein castaneis, glabris, lævibus, flabelliformibus vel cuneatis, postice in stipitem lateralem productis (2-3 c.m. alt.), margine pallidiore, subtus sterili, tenui, lacerato vel dentato; aculeis subtilis, confertis, brevibus, albido-pallidis.

Ad truncos. Perak. (1660.)

Somewhat resembling *Stereum elegans*.

Helotiella stromatica, Cooke.

Hypophylla, stromate atro, orbiculari (5 m.m. diam.) insidens. Cupulis sessilibus ($\frac{1}{6}$ m.m.), gregariis, plano-convexis, mollis, ceraceis vel ochraceis, extus saccharino-granulatis, pallidioribus. Ascis clavatis, sporidiis fusoideis, uniseptatis ($30 \times 6 \mu$), hyalinis, utrinque appendiculatis.

On dead leaves. Brazil. (Glaziou, 18,799.)

Dothidella Bambusæ, Cooke.

Epiphylla. Stromatibus oblongis ellipticisve, minutis, convexis, atris ($\frac{1}{2}$ -1 m.m. long), loculis paucis. Ascis clavatis, sporidiis lanceolatis, medio uniseptatis, intus granulatis, pallidis, $40-45 \times 10 \mu$.

On bamboo leaves. Brazil. (Glaziou, 18,794.)

Clypeolum dissiliens, Cooke.

Peritheciis sparsis, superficialibus, sæpe gregariis, macula nulla insidentibus, lenticularis, glaberrimis, atris, nitidis ($\frac{1}{2}$ m.m.), carbonaceis, astomis. Ascis subclavatis, octosporis. Sporidiis fusiformibus, uniseptatis, medio dissilientibus, hyalinis, intus granulatis vel nucleolatis ($70-80 \times 8 \mu$).

On coriaceous leaves. Brazil. (Glaziou, 18,739.)

Metasphæria pusilla, Cooke.

Hypophylla, gregaria. Peritheciis minutis, innatis, plagias latas efformantibus, ostiolo papillato. Ascis clavatis, sporidiis fusiformibus, primitis uniseptatis, nucleatis, demum leniter quinqueseptatis, hyalinis, $40 \times 80 \mu$.

On coriaceous leaves. Brazil. (Glaziou, 18,798.)

Helminthosporium Bambusæ, Cooke.

Cæspitulis compactis, convexis, atris, gregariis, plerumque sphaeriæformibus. Hyphis fasciculatis, erectis, teretis, septatis, pallide fuscis vel subfuliginis. Conidiis acrogenis, lanceolatis, superne acutis, 3-5 septatis, nec constrictis, pallide fuscis, $60-70 \times 12 \mu$. Episporio tenui.

On *Bambusa spinosa*. Assam. (Mann.)

Stereum monochroum, Cooke & Mass.

Flabelliform, attached by a narrow base, very thin, imbricated; pileus minutely velvety, bright ferruginous-brown, becoming glabrous and darker with age, indistinctly zoned, closely radiato-rugulose; hymenium delicately whitish-pruinose, becoming glabrous; brown with a red tinge; spores elliptical, colourless, $12 \times 5-6 \mu$.

On dead wood. Perak.

Pilei 1-2 in. across, rigid when dry. Allied to *S. respilloneum*, Berk., but distinguished by the radiato-rugulose, bright ferruginous pileus, and the larger spores.

***Stereum latum*, Cooke & Mass.**

Very broadly effused, resupinate, thin, and following the irregularities of the substratum; margin broadly free all round, but scarcely or not at all reflexed, lobed and repand; pileus velvety-strigose, with numerous narrow concentric ridges, uniform yellowish-cinnamon; hymenium minutely whitish-pruinose, cinnamon with a decided tinge of pink, nodulose in the resupinate portion, due to inequalities of the matrix, smooth in the marginal, free portion; spores colourless, globose, apiculate, $10\ \mu$ diam.

On dead bark. Perak.

Patches exceeding a foot in length, 6 in. across; free margin, 1-2 in. broad.

AUSTRALIAN CHARACEÆ.*

Now that particular attention is being directed to the Cryptogamic plants of Australia, it is satisfactory to find that the services of Professor Nordstedt have been secured for the illustration of the Characeæ. It is a small group, but if this venture is encouraged it might, in time, lead to the subsidizing of the same excellent Algologist to undertake the Fresh Water Algæ of Australia. The present work is of a large imperial quarto size, and the plates are admirably executed, each plate, with its corresponding text, being capable of being bound, when complete, in any sequence desirable. Of course the letterpress is in English, which will be of considerable advantage in an English-speaking colony, and even in the mother country such a work should be acceptable. We, therefore, strongly commend it to our readers.

GREVILLEA.—NOTICE.

For twenty years have we continued, periodically, to issue the numbers of this Journal, as a labour of love; with the next part the twentieth volume will come to a close, and with it the present series. It is not without feelings of regret that this resolution has been taken, but fickle health, increasing years, and diminished vigour have been the excuses which have presented themselves, and we would willingly transfer the work to other hands. Whether some more enterprising proprietor can be found is as yet uncertain; our only concern now is to make known our determination to stand open to any proposal whereby our pecuniary interest shall cease, so that we may rest from the periodical anxieties of the past two decades. Whether we have earned this repose is not for us to determine, but we are never blind to our own failings, any more than to those of others, and can only wish that what we have done had been better done, even although we have endeavoured to do our best.

* "Australian Characeæ," figured and described by Otto Nordstedt. 4to., Part I., 10 plates (seven shillings). Lund and Berlin, 1891.

NEW BRITISH FRESH WATER ALGÆ.

Mr. A. W. Bennett has recorded in the "Journal of the Royal Microscopical Society" for February, 1892, the species of Fresh Water Algæ met with in a corner of South West Surrey, which contains a few new or interesting species. Amongst the latter are:—

Trochiscia pachyderma (Reinsch.) Hans. See Bennett Journ. R. M. S., t. II., fig. 1.

Pediastrum glanduliferum. Bennett Journ. R.M.S., t. II., figs. 5-7.

Cœnobium elliptical, 300-400 μ , very dark green, solid, or with only very small intercellular spaces; marginal cells usually pentagonal or hexagonal, with a small semi-circular incision in the external wall, two horned, each horn springing from about mid-way between the side wall and the incision in the external wall, quite hyaline, and sharply cut off from the endochrome of the cell, very slender capitate; marginal cells about $12.5 \times 10 \mu$; horns about 15μ long. The marginal cells somewhat resemble those of *P. Ehrenbergii*, but are not so deeply indented. The shape of the incision and the round knobs at the extremity of the horns distinguish this pretty species from any other in the genus.

Among water-weeds in pond. Frensham.

Tetmemorus minutus. DBy. Conj., p. 74, t. V., f. 10. Bennett Journ. R. M. S., t. II., f. 8-9.

Length 45-50 μ , breadth 15-18 μ .

Punchbowl, Hindhead.

Micrasterias rotata, var. **acutidentata.** Benn. Journ. R. M. S., 1892, t. II., fig. 10.

Terminal lobes of semi-cells bilobulate, with bidentate lobuli. Some of the lobuli of the lateral lobes tridentate, especially those at each extremity. Teeth of terminal lobes much sharper than in the normal form.

Punchbowl, Hindhead.

Euastrum inerme. Lund.

Punchbowl, Hindhead.

Cosmarium minutum. Benn. Journ. R. M. S., 1892, t. II., fig. 11.

Very minute. Length and breadth about 15-18 μ , semi-cells hexagonal; ends quite straight and parallel, each side representing a nearly equilateral triangle; incision narrow and deep; a large conspicuous pyrenoid in the middle of each semi-cell.

In bog pools.

Cosmarium Ungerianum. (Nag.), Arch. Benn. Journ. R. M. S., 1892, t. II., figs. 12-13.

Medium size. Outline nearly equilateral triangle. Length 70-80 μ ; breadth about 75 μ ; sides 42 μ ; very nearly straight, or slightly convex, with rounded base; ends 42 μ , quite straight, sinus moderately deep, triangular; membrane rough with pearly

granules, which are wanting at the two extremities; two conspicuous pyrenoids in each semi-cell.

In bog pools. Hindhead.

Cosmarium Westianum. *Benn. Journ. R. M. S.*, 1892, t. 11., fig. 14.

Medium size. Semi-cells subreniform. Length of frond about $52\ \mu$; breadth about $50\ \mu$; sides $17.5\ \mu$; somewhat converging towards the apex, with about four deep crenations; apex about $25\ \mu$ long, slightly convex, with five shallow crenations; at the corners, between the sides and the apex, is a bifid projection; sinus rather wide. Membrane quite smooth, but with conspicuous punctations arranged in regular series, wanting in the isthmus. One conspicuous pyrenoid in each semi-cell.

In bog pools. Hindhead.

The species not before recorded for Great Britain, although previously recorded for Ireland, are:—

Closterium calosporum, *Wittr.*

Mesotænium chlamydosporum, *DBy.*

Staurostrum aversum, *Lund.*

The species called *Nostoc hyalinum* (Benn.), *Journ. R. M. S.*, 1887, t. 1, f. 2, is here named *Nostoc opalinum* (Benn.).

MEMORABILIA.

PILOCRATERA ENGLERIANA, *Henn. in Engl. Bot. Jahr.*, 1891, p. 363, pl. VI., fig. 9, seems to be *Trichoscypha Hindsii* (Berk.) Cooke Myco., f. 200.

ENDOCONIDIUM AMPELOPHILUM, *Pat. Bull. Soc. Myc. de Fr.*, VII., 1891, p. 183. Can any one demonstrate how the genus *Endoconidium* (Pr. & Del.), differs from *Bloxamia* (B. & Br.), at least as interpreted by Patouillard?

TRANSACTIONS OF THE YORKSHIRE NATURALISTS' UNION.

Although not containing anything of interest to Cryptogamic Botanists, we have to call attention to the above useful Transactions, and especially to Parts 11, 12, 13, and 15, which contain a second edition of "North Yorkshire; studies of its Botany, Geology, Climate, and Physical Geography," by J. G. Baker, F.R.S. The portion issued consists for the most part of the Introduction, and the essays on the Geology, Lithology, Climatology, Topography, and Physical Geography, with descriptions of the several districts. This is certainly a valuable contribution to local scientific literature, and will commend itself to all who are interested in the "big county."

NEW BRITISH FUNGI.

By M. C. COOKE.

*(Continued from p. 38).***Agaricus (Collybia) bibulosus, Massee.**

Pileus (1-2 in. across) fleshy, subglobose, obtuse, then expanded, moist, very smooth and even, dark obscure green when moist, pale grey or whitish when dry. Stem cartilaginous, spongy, stuffed, becoming imperfectly hollow, tapering upwards, minutely fibrillose-striate ($1\frac{1}{2}$ -2 in. long, $\frac{2}{3}$ in. thick at base), pale clear brown, darkest below. Gills narrow, crowded, thin, margin rather undulate, dingy, slightly adnexed, separated from the flesh of the pileus by a dark cartilaginous line, which is a continuation of the outer portion of the stem; spores subpyriform ($6 \times 3 \mu$).

On stumps. Burnham Beeches.

In groups of 2 to 4, pileus very bibulous, changing from blackish green to pale grey when drying, rooting into the wood. Allied in many respects to *Ag. butyraceus*.

Mr. Worthington G. Smith informs us of his knowledge of the following species having been found in Britain.

Agaricus (Tricholoma) coryphæus, Fr. Hym. Eur. 48. Vent. t. 36, f. 1-3.

On the ground. Morpeth.

Agaricus (Pluteus) umbrinellus, Somm. Fr. Hym. Eur. 188.

On the ground. Shrewsbury.

Agaricus (Entoloma) pluteoides, Fr. Mon. II., 345. Fr. Hym. Eur. 195.

On rotten wood. Morpeth.

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Grevillea.

A QUARTERLY RECORD OF CRYPTOGAMIC BOTANY
AND ITS LITERATURE.

RUSSULA REDIVIVA.

(Continued from p. 81.)

FURCATÆ. *Fries Hym. Eur.* 441.

Pileus compact, firm, covered with a thin, closely adnate pellicle, which at length disappears. Margin abruptly thin, at first inflexed, then spreading, *acute, even*. Stem at first compact, at length spongy-soft within; gills *somewhat forked*, with a few shorter ones intermixed, commonly attenuated at both ends, thin and normally narrow.

1189. *Russula (Furcatæ) olivascens.* *Fr. Hym. Eur.* 441. *Fr. Mon.* II., 187. *Fries Icones.* t. 172, f. 2. *Cooke Hdbk.* VI., p. 321. *Cooke Illus.* t. 1035. *Sacc. Syll.* v., 1797. *Krapf.* I., t. 9. ?

Pileus everywhere fleshy, flattened, umbilicate, olivaceous, the disc becoming yellow, margin even, stem firm, even, white, gills attenuated behind, crowded, almost equal, white, becoming yellowish; spores ochraceous.

Amongst grass.

This noble species from its habit is placed with *Furcatæ*, probably the rarely furcate gills approach to *Fragiles*. In many other respects it agrees with *Compactæ*.—*Fr. Hym. Eur.* 441.

Stem firm, but spongy within, $1\frac{1}{2}$ in. long, 1 in. thick, even, white. Pileus convex, then flattened, umbilicate, everywhere fleshy, margin even, 2 in. or a little more diam., olive, becoming yellowish at the disc. Flesh rather thick, white. Gills attenuated behind, touching the stem, crowded, broader in front, subequal and rarely furcate, white, then becoming yellowish, taste mild. This species agreeing in many points with *Compactæ*, but with a different habit, is referred to *Furcatæ*. The form of the gills approaches to *Fragiles*, but the pileus to this section.—*Fries Mon.* p. 187.

SPORES.— $8-10 \times 6-8 \mu$ (Britz.); $8-10 \times 6-8 \mu$ (Sacc.); 8μ diam. (Quel.); $11-12 \mu$ (Massee).

Fries does not consider this to be *R. olivascens*, Pers. or Secretan, No. 498, which he refers to *Russula alutacea*.

1190. *Russula (Furcatæ) furcata.* *Pers. Syn. Fries Hym. Eur.* 441. *Mon. Hym.* II., 187. *Stevenson B. F.* II., 116. *Secr.* 515, 518. *Sacc. Syll.* 1798. *Cooke Hdbk.* I., 616; II., 1190. *Cooke Illus. t.* 1036. *Krombholz t.* 62, f. 1, 2; t. 69, f. 18-22. *Schæff. t.* 94, f. 1. *Bulliard t.* 26. *Paulet t.* 74, f. 1. *Barla t.* 16, f. 1-9. *Harzer t.* 54; t. 63, f. 5.

Mild, then rather bitter; pileus fleshy, rigid, plano-gibbous, then depressed and infundibuliform, *even, overspread with a silky lustre*, and becoming smooth, margin even, acute; stem stout, firm, *even*, attenuated downwards; gills *adnate-decurrent*, rather thick, somewhat distant, furcate, pure white.

In woods.

Allied rather to *R. rubra* than to *R. virescens*, but differing from these in the form of the pileus, acute margin at first inflexed, separable pellicle, which does not break up into warts, and in the type of the gills. Pileus sometimes umber or bright green, but it is also fuscous, becoming whitish.—*Fries Hym. Eur.* 441.

Obs.—Barla's figures are of too bright and grassy a green to represent the usual form of this species well, and the same remark applies to the bright coloration of Viviani's t. 60, and Krombholz's t. 62, f. 1, 2.—*M. C. C.*

Spores.—6-7 μ (C. B. P.); 8-9 μ (Britz.); 7-8 μ (Sacc.)

Taste becoming bitter. Stem solid, firm, 2 in. or more long, equal or attenuated downwards, even, white; pileus fleshy, compact, gibbous, then plano-depressed or funnel-shaped, even, smooth, but often having a silky lustre, 3 in. broad, either ærginous green or umber turning greenish, but variable in colour. Pellicle of the pileus separable here and there. Margin thin, at first inflexed, then patent, always even. Flesh firm, rather cheesy, white; gills adnate, decurrent, rather thick, somewhat distant, broad, attenuated at both ends, frequently forked, white.—*Fr. Mon.* 188.

Pileus of a sombre green, unequal in tint, darkest in the centre, lighter at the margin, dull like cloth, successively convex, with the centre a little elevated, then plane, and at length concave. Sometimes excentric. Diam. 4 in. Flesh white, cheesy, brittle, 5 lines thick, vinous red under the cuticle, which is easily separated. Gills white, not very numerous, firm, fragile, 4 lines wide, frequently bifurcate or trifurcate at different lengths, concave, straight, or convex, following the form of the pileus, all of them bifid at the same distance from the stem, some dimidiate. Stem white, 3 in. long, 9-10 lines thick, cylindrical, straight, a little attenuated and curved at the base, solid. Whole plant firm and brittle. Odour bad.—*Secr. No.* 515.

var. **pictipes.** *Cooke Hdbk.* II., p. 321. *Illus. t.* 1086.

Pileus convex, then expanded, depressed in the centre, dark olive green, margin acute, and when fully mature faintly striate.

Stem firm, stuffed and soon spongy within, and white, long, commonly attenuated downwards, rosy or purple at the apex, tinged with greenish at the base, flesh beneath the cuticle and gills near the margin tinged with rose or purple, gills adnate or subdecurrent, rather thick, furcate, white.

Under trees.

Pileus as much as 5 or 6 in. in diameter, stem 4 or 5 in. long, an inch or more thick at the apex, gradually attenuated downwards. Taste mild. Spores white, subglobose, 8 μ diam. Cuticle separable at the margin, rosy beneath.

This variety differs from the typical form in the faintly striate margin, persistently mild taste, and in the stem being tinged with rose or rosy purple at the apex, and greenish at the base.—*M. C. C.*

var. *graminicolor*. *Seer. No. 518.*

Differs only in the pale green or grass green colour of the pileus, and hardly deserves to be regarded as a variety. The following is the brief description:—

var. A.—Pileus pale green, meadow green, darker at the centre, dull, but not tessellated, convexo-plane, centre a little depressed. Diam. 7-8 in. Gills white, thick, 6 lines wide, often furcate. Stem 4 in. long, 1 in. thick, white, a little curved and attenuated at the foot.

var. B.—Pileus a fine grass green, gills white, soft to the point of being reduced to a paste. This is smaller than var. A.

var. *ochroviridis*. *Cooke Hdbk. II., p. 322. Illus. t. 1100.*

Pileus fleshy, flattened, then depressed (4 in. or more), at first viscid, polished when dry, with a thin adnate pellicle, ochraceous towards the margin, disc olivaceous or fuliginous, margin spreading, even, acute; stem short, thick, 2 in. long, 1 in. thick, reticulately rugose, white, rarely growing pallid, flesh fuliginous or cinereous when cut, stuffed, spongy within; gills attenuated both ways, lanceolate (6 m.m. broad in the centre), crowded, many furcate, white, becoming a little dirty white when old. Spores white, subglobose, 9 \times 7 μ , faintly granular. Taste mild.

On the ground.

Obs.—It resembles *R. ochroleuca* in the rugose stem, but this differs in not becoming cinereous, also in the dark dingy olive centre of the pileus, narrow gills, discoloration of the flesh, mild taste, and large size. In habit it resembles *R. furcata*, but differs in the paler greenish-ochre pileus, narrower gills, rugose stem, and discoloured flesh. It differs also from *R. viruginea* in the margin not being striate, in the stem being short and rugose, and in the gills being crowded.

Spores 9 \times 7 μ .—(*M. C. C.*).

1191. *Russula (Furcata) sanguinea.* *Bull. Champ. t. 42. Fr. Mon.* II., 188. *Fr. Hym. Eur. 442. Sacc. Syll. 1800. Secr. No. 505?* *Sterénson* II., 116. *Cooke Hdbk. i., 617; II., 1191. Cooke Illus. t. 1019.*

Acrid, pileus fleshy, firm, convex, gibbous, then depressed and infundibuliform, turning smooth, moist, margin thin, acute, even, stem spongy, solid, rather striate, white or reddish; gills decurrent, thin, very crowded, somewhat furcate, connected, white.

In moist grassy places in woods.

Wholly different from *R. rubra*, flesh solid, firm, gills adnate, then deeply decurrent, very narrow, acuminate behind, stem at first constricted above. Pileus commonly blood-red, or chiefly about the margin becoming whitish.—*Fr. Hym. Eur. 442.*

Taste acrid, peppery, stem stout, spongy, stuffed, at first at the apex contracted, then equal, finely striate, white or reddish, pileus fleshy, firm, at first convex, obtuse, then depressed, infundibuliform, and the centre commonly gibbous, polished, even, moist in wet weather, 2-3 in. broad, blood-red or growing pale about the even patent margin. Flesh firm, cheesy, white. Gills at first adnate, then truly decurrent, very much crowded, very narrow, connected by veins, fragile, somewhat furcate, white. Confounded often with *R. rubra* of the same colour, but this is more rigid, flesh grumous, &c., very different.—*Fr. Mon. p. 188.*

The following is Secretan's description, as cited doubtfully by Fries:—

Agaricus emeticus. *Secr. No. 505. Schff. t. 15, f. 4, 5, 6. Batsch. f. 13. Sow. t. 201, red fig.*

Pileus at first white, mixed with cherry-red, then of a lively-red, scarlet; finally the tint varies from cherry-red to fresh blood-red and vermilion, drawing sometimes to vermilion, the centre is at length dark. It approaches convex, then umbonate; often oblong; margin sinuate, at length concave, the margin raised very high, finishing by closing up irregularly above; diam. $4\frac{1}{2}$ in.; flesh white, cheesy, 6 lines thick.

Gills white at all ages, appearing somewhat numerous, crowded, at last seen separate and held to the bottom by large veins. They are slender, fragile, 4-6 lines wide, anastomosing, furcate near the stem, they following the forms of the pileus and adhering to the stem at unequal heights.

Stem nearly a dull white, it takes by-and-bye a rosy tint, or red, which in old age sometimes cover it entirely. It is $3\frac{1}{2}$ in. long, 9-10 lines thick, straight or curved, swollen at the foot, when old it is attenuated conically at the base. It becomes hollow as the flesh is destroyed by insects. Solid when of a prime age. Summer and autumn.

OBS.—By an unfortunate mistake the synopsis of Persoon quotes here the figs. O. and P. of pl. 509 of Bulliard, which is wrong. The same error is copied by Fries.—*Secr. 505.*

NOTE.—This species should be readily distinguished, amongst the red species, by the decurrent gills, as shown in Bulliard's figure. Krombholz, t. 65, f. 1-6, is not of the right colour, and the gills are not decurrent.—*M. C. C.*

1192. *Russula (Furcata) rosacea.* *Fr. Hym. Eur.* 442. *Fr. Mon.* II., 188. *Berk. Outl.* 210. *Cooke Hdbk.* I., 618; II., 1192. *Sacc. Syll.* 1801. *Stenerson B. F.* II., 116. *Bull. t.* 509, f. Z. = *Ag. exalbicans*, *Secr.* 512 (*variety*). *Cooke Illus. t.* 1020.

Slowly acrid. Pileus compact, convex, then plane, *unequal, viscid, then dry, variegated with spots, margin acute, even*; stem spongy or solid, even, white or reddish; gills adnate, rather crowded, plane, unequal, white, divided behind.

In fir woods.

Allied to *R. sanguinea*, but irregular, often excentric, pileus subrepand, *scarcely depressed*, gills less crowded, broader, less divided, scarcely connected. The colour varies in intensity from flesh-colour, viscid pellicle growing pale, blotched with darker spots.—*Fr. Hym. Eur.* 442.

Taste slowly acrid. Stem solid, firm, internally at length spongy, even, smooth, 2 in. long, sometimes ventricose, white or reddish. Pileus compact, fleshy, at first convex, then expanded, obtuse, but never depressed, commonly unequal, repand, even, incised, 2-4 in. broad, pellicle in moist weather viscid and separable, but when this disappears the pileus is whitened, often variegated with darker spots. Flesh firm, cheesy, white. Gills in all states adnate, thin, crowded, fragile, furcate behind, with dimidiate intermixed, always persistently white.—*Fr. Mon.* 188.

SPORES.—7 μ (W. G. S.); 8-9 \times 6-7 μ (Britz.); 8-9 \times 6-7 μ (Sacc.)

var. *exalbicans.* *Secr. No.* 512.

Emerging from the ground the pileus is white, a little yellowish, streaked on one side with a very faint rose tint; then it is white, the centre yellowish and shining. Sometimes the purple colour is confined to one side, sometimes it prevails at the margin, all round, in old age the coloured tints disappearing almost entirely, and the white turns a little to blackish. It is convex, then plane, the centre depressed, the extremity of the margin finely striate. Diam. $1\frac{3}{4}$ in. In oldest state the margin is deeply split.

Gills white, in old age turning to yellowish, they are rather numerous, 3 lines wide, adnate. In old age undulated by alternate thickenings, which are most to be remarked near the stem. At the point of adhesion they are fastened by numerous buttresses.

Stem all white, $1\frac{3}{4}$ in. long, 7-9 lines thick, swollen conically at the summit, a little thickened at the foot. It is shining, solid, so is in general all the plant.

OBS.—This species, more or less shining, should be distinguished with care from *R. roseo-granulata*.—*Secr.* 512.

NOTE.—The figures of Krapf, Heft. I., t. 1, figs. 1 to 7, may, perhaps, belong to this species.

- 1193. *Russula (Furcatæ) maculata.*** *Quel. & Roze Soc. Bot. Fr.* 1877, 323, t. v., fig. 8. *Sacc. Syll. No.* 1804. *Cooke Hdbk.* II., No. 1193. *Cooke Illus. t.* 1069.

Pileus solid, convex, plane, viscid, reddish flesh-colour, pallid, then decoloured, spotted with purple or brown, margin undulate, and sometimes darker (5-9 c.m. diam.). Flesh white, *peppery*, and smelling of rose; stem short, solid, striato-reticulate, white or somewhat rosy, then spotted with ochre; gills attenuate, adnate, furcate, *pale sulphur*, then *peach colour*.—*Quelet*.

In woods.

Obs.—Evidently resembling *R. depallens*, but *acrid*, and with coloured gills, but without a grey stem.

SPORES.—10 μ (Sacc.)

- 1194. *Russula (Furcatæ) sardonia.*** *Fr. Hym. Eur.* 442. *Fr. Mon.* II., 189. *Cooke Hdbk.* I., 69; II., 1194. *Cooke Illus. t.* 1037. *Berk. Outl.* 211. *Sacc. Syll.* 1802. *Stevenson II.*, 117. *Seer.* 509. *A. aureus, Kromb. t.* 68, f. 1-4. *Schæff. t.* 16, f. 56. *Bresadola t.* 44.

Pileus fleshy, firm, convex, then plane and depressed, smooth, pellicle thin, adnate, viscid, becoming decoloured, *margin even*, stem spongy, solid, short, *white or reddish*, gills adnate, *much crowded*, subfurcate, white, then *yellowish*.

In pine woods by waysides.

Firm, irregular, colour of gills and stem distinct from *R. rosacea*. *Gills weeping* in wet weather, and in dry marked with yellowish spots.—*Fr. Hym.* 442.

Species robust, firm, but not large. Stem solid, firm, but internally at length spongy, $1\frac{1}{2}$ -2 in. long, 1 in. thick, even, white, or reddish. Pileus fleshy, compact, convex, then plane, rarely depressed, but here and there repand, even 2-3 in. broad, pellicle adnate, viscid in moist weather, soon decoloured, and then often spotted. Colour very mutable, now red, now pallid, spotted yellow, now dingy yellow, opaque. Flesh as in *R. rosacea*. Gills adnate, crowded, broad, somewhat furcate, white, in wet weather weeping drops of water, hence spotted yellowish when dry. Holds a place between *R. rosacea* and *R. depallens*, but in the yellow colour distinct from both.—*Fr. Mon.* 189.

SPORES 8-10 \times 8 μ (Britz.), 8-10 \times 8 μ (Sacc.).

- Agaricus versicolor rubra.*** *Seer.* 509.

Pileus approaches a fine red, blood colour, lively crimson, then a bright rose, it is afterwards discoloured by large white patches, turning yellowish, the patches sometimes occupying the centre, sometimes, and more commonly, the margin. In old age the pileus has the patches of a glossy yellow, and ultimately entirely of this colour. It is in good time convexo-plane, the margin creased, the upper part humped (umbonate), and finally the centre is depressed, more or less. Diam. $2\frac{1}{2}$ -3 in. It exhibits no striæ. Flesh white, red under the epidermis, it is conical, six lines thick, soft cheesy, gnawed in good time by the worms.

Stem of a rose-tint, especially at the summit, and often only on one side; the base takes a yellow tint. It is $1\frac{3}{4}$ - $2\frac{1}{4}$ in. long, 7-9 lines thick, the foot slightly curved and thickened. The flesh the same as the pileus. The stem is soft, the interior soon destroyed. The odour a little penetrating.

Gills white, taking soon a yellowish glance, changing. In perishing it offers yellow spots, especially at the edge of the pileus. They are very numerous, concave or convex, following the inflexion of the pileus, annexed, slender, anastomosing, bifid, 2-3 lines broad, with the largest breadth at the middle.—*Secr.* 509.

OBS.—Of the two forms which occur, the yellow is most common in this country; the red is represented in the figures of Bresadola and Schæffer, and one of the figures of Krombholz.—*M. C. C.*

1195. *Russula (Furcata) depallens.* *Fr. Hym. Eur.* 442. *Fr. Mon.* II., 189. *Pers. Syn.* 440. *Cooke Hdbk.* I., 620; II., 1195. *Cooke Illus.* t. 1021. *Sacc. Syll.* 1803. *Stevenson* II., 117. *Berk. Outl.* 211. *Russula luteo violacea*, *Kromb.* t. 66, f. 12. *Secr.* 510. *Gillet Hymenomyces.*

Mild. Pileus fleshy, firm, *undulate, deformed*, even, opaque, thin, viscid pellicle adnate, here and there growing pale, margin without striæ, at length faintly striate, stem firm, attenuated downwards, *white, becoming cinereous*, gills adnexed, crowded, fragile, forked behind, whitish.

Amongst moss.

Pileus at first reddish or fuscous, soon, chiefly at the disc, turning whitish, yellowish, etc. Edible.—*Fr. Hym. Eur.* 442.

In woods chiefly of birch, by grassy waysides.

Inodorous; taste mild. Stem solid, firm, commonly attenuated downwards, $1\frac{1}{2}$ in. long, white, when old becoming cinereous. Pileus fleshy, firm, convex, then plane, rarely depressed, but commonly undulately deformed, even, the thin adnate pellicle principally decoloured at the disc. Margin patent, even, when exolute striate. Colour of the pileus at first pallid red or fuscous, then whitish or yellowish, in all states opaque. Flesh white. Gills adnexed, broad, crowded, distinct, but commonly furcate at the base, often mixed with shorter. Approaching *Heterophyllæ*.—*Fr. Mon.* 189.

Stem solid, about $1\frac{1}{2}$ in. long. Pileus rarely depressed, but often undulate, at first pale-reddish or brownish, then whitish or yellowish, in all states opaque. Flesh white, mild. Gills forked at the base, with shorter ones intermixed.—*Cooke Hdbk.* I., 620.

Agaricus depallens. *Secr. No.* 510. *Paul.* t. 75, f. 6, 7, 8. *Bull.* t. 42.

Pileus of a false red, turning to crimson, deep and dull rose, dull, without striæ. It is quick to decolour, presently by moist spots, or presently by the whole entire turning dull white, so as not to be recognizable. It is, according to age, convex, plane,

and finally concave. Diam. 4 in. Flesh white, 6 lines thick, conical.

Gills white, turning dull white, numerous, slender at the edge, singularly fragile, 4 lines broad, straight or convex, adnate; a few short gills. They are much veined, anastomosing.

Stem covered below with a rose-tint, at length with an ashy-grey lustre, 2 in. long, 6-9 lines thick, straight, attenuated and recurved at the foot. It remains for a long time very hard, but at length it becomes hollow, because the interior is devoured by insects. Flesh is ashy-grey. Very distinct species.

Under firs.

Obs.—Persoon cites for his *A. depallens* Schæffer's t. 112, which is manifestly a false impression, and which was copied by Fries in his *Obs. Myc.* i., p. 69. It is the plate 92 of Schæffer which he would have cited, which appears to belong rather to my *A. hemerocalle*, var. *A.* (No. 508, *R. emetica*).—*Secr.* 510.

NOTE.—This is undoubtedly a common species with us. The purplish-red and soon decoloured pileus, with the stem becoming cinereous, readily distinguish it. *R. maculata* has a superficial resemblance, but that species is not mild, the gills are coloured, and the stem does not become cinereous.—*M. C. C.*

1195 bis. *Russula (Furcatæ) virginea.* Cke. & Mass. *Grevillea* xix., 4. Cooke *Illus. Supp. t.* 1197.

Mild. Pileus fleshy, firm, convex, then depressed (5 c.m. diam.), smooth, even, viscid when moist, polished when dry, margin even, snow-white. Stem attenuated upwards, firm, solid (5 c.m. long, 2 c.m. thick at the base), finely rugulose; gills very narrow, crowded, subdecurrent, repeatedly forked, connected by veins, brittle, as well as the stem quite white. Spores globose, 4 μ diam.

Under trees.

Obs.—This species cannot be referred to *Russula lactea*, by reason of the narrow, crowded, and decurrent gills. Neither can it be considered as an albino form of *R. sanguinea*, by reason of its mildness. Although hitherto found but once, it has all the appearances of a good and distinct species.

1196. *Russula (Furcatæ) purpurea.* Gillet *Hymen. Ser.* xi., pl. x. *Sacc. Syll. No.* 1805. Cooke *Hdbk.* ii., 1196. Cooke *Illus. t.* 1022.

Pileus fleshy, at first hemispherical, then convex, and more or less depressed in the centre, rugoso-plicate, dark purple, centre darker, margin even, or soon striatulate (6-10 c.m.). Flesh yellowish, red under the cuticle; stem slightly incrassated at the base, longitudinally striate, apex white, middle rosy, base yellowish. Gills rounded, broad, often bifid, white, then yellowish = *Sacc.*

Under spruce.

SPORES 8-10 \times 8 μ (Sacc.).

Obs.—Undoubtedly this is closely allied to *Russula cærulea*, and sometimes difficult to distinguish, but the gills do not become so

distinctly yellow, and the spores are smaller. The roseate tint on the stem, about the middle, is sometimes faint or obsolete. Although not mentioned in the original description, our specimens were rather mild, and the pileus slightly viscid.—*M. C. C.*

1197. *Russula (Furcatæ) cœrulea.* *Pers. Syn.* 445. *Fr. Hym. Eur.* 443. *Fr. Mon.* II., 205. *Sacc. Syll.* 1806. *Cooke Hdbk.* II., 1197. *Cooke Illus.* t. 1052. *Price f.* 124 (but gills white). *Krombh.* t. 64, f. 10-11; t. 68, f. 5-8.

Mild. Pileus fleshy, convex, then flattened or depressed, polished, *margin even*; stem spongy, solid, firm, white; gills adnate, subequal, turning yellowish, acute at the apex.

In woods of birch.

Pileus becoming bluish, subrufescent or fuscous, blue at the middle.—*Fr. Hym. Eur.* 443.

In birch woods. To me its place is uncertain. Very possibly the habit of *R. cyanoxantha*, taste mild, but gills crowded, yellow. Colour of the pileus cœrulean or purple lilac; margin even.—*Fr. Mon.* 205.

SPORES 8-10 × 8 μ (Britz.).

Obs.—Whether Mrs. Price's figure (124), with white gills, should be referred to this species may be open to doubt. We have never seen a *Russula* with such a decidedly blue pileus. Quelet ("Especies nouvelles," 1882) has a species which he calls *R. palumbina*, Paulet, and bases it upon Paulet's t. 76, f. 2-3. Of this he says *R. grisea*, *R. cœrulea*, and *R. olivascens*, Pers., are varieties. Saccardo refers Quelet's species to *Russula suavis*, Schulz., and retains the three species intact which Quelet absorbs.—*M. C. C.*

1198. *Russula (Furcatæ) drimeia.* *Cooke Grevillea* X., p. 46. *Cooke Hdbk.* II., 1198. *Cooke Illus.* t. 1023. *Sacc. Syll.* 1807. *Stevenson* II., 118.

Acrid, peppery. Pileus compact, firm, convex, then depressed, scarcely viscid when moist, opaque when dry, bright purple (2-4 in. diam.), margin subincurved, even; stem solid (2-3 in. long, $\frac{1}{2}$ - $\frac{3}{4}$ in. thick), firm, cylindrical, equal, tinged with purple; gills adnexed, scarcely crowded, narrow and furcate at the base, at first pale sulphur yellow, then deeper yellow, never white; spores pale ochre.

On the ground under larch.

Obs.—So intensely peppery that after tasting a small fragment the tongue tingled for more than half-an-hour. Colour and habit of *R. Queletii*, but distinguished by the yellow gills, ochraceous spores, and intense peppery taste.—*M. C. C.*

ADDITIONAL FUNGI DESCRIPTIONS.

By M. C. COOKE.

Poria albo-cincta, Cke. & Mass.

Tota resupinata, atro-cinerea, demum fissurato-fatiscens; margine lato, niveo, pulverulento, tenui; tubulis circa 1 m.m. longis, poris minutissimis, inconspicuis. Sporis ellipticis, $4 \times 2 \mu$.

On bark. St. Vincent.

Cystopus euphorbiæ, Cke. & Mass.

Soris plerumque cauliculis, oblongis, confluentibusque, in plagas atrofuscas insidentibus; conidiis subglobosis vel oblongis $12 \times 8 \mu$, achrois, membrana minute asperulo, subcrasso; oosporis subglobosis, levibus, succineis, $15 \times 12 \mu$ (junior).

On *Euphorbia hebecarpa*. Persia, east of Bachtuary country, Kuh Bul, 11,000 feet. (Dr. Stapf.)

Sphæropsis Hibisci, Cooke. Sphæria (Obtecta), Berk. in Herb.

Peritheciis gregariis, globoso-depressis, atris, papillatis, inter fibras corticis immersis, epidermide tectis, perforatis ($\frac{2}{3}$ -1 m.m. diam.). Sporulis ovoideis vel ellipticis, rotundatis, atro-brunneis, opacis, $12-14 \times 9 \mu$.

On bark of *Hibiscus Syriacus*. S. Carolina (1491, 1854, 2140.)

Melasmia ribicola, Cke. & Mass.

Maculis epiphyllis, pallidis, orbicularibus. Stromatibus effusis, atris (1 c.m. diam.), rugulosis; cellulis immersis; sporulis cylindricis, rectis, tenuibus, hyalinis ($3 \times 0.5 \mu$).

On leaves of *Ribes*. Bolivia.

Zythia bicolor (B. & Br.), Cooke & Mass. Ophiotheca bicolor, Berk. & Br. in Herb.

Subsuperficialia, rufo-aurantiaca. Peritheciis subglobosis, fragilibus, levibus, sporulis ellipticis, minutis, continuis, hyalinis, $3 \times 1\frac{1}{2} \mu$.

On fruits of *Nephelium lappaceum*. Ceylon. (Thwaites, 350.)

Penicillium flavo-virens, Cke. & Mass.

Cespitulis densis, effusis, floccosis, flavo-virentibus; hyphis sterilibus repentibus, intricatis, fertilibus assurgentibus, suberectis, ad apicem bifurcatis, strictis. Conidiis concatenatis, ellipticis, minutis, hyalinis, $3-4 \times 1 \mu$.

On fruit of *Terminalia belerica*. Ceylon. (Thwaites, 374.)

Valsa tenebricosa (B. & Br.). Sphæria tenebricosa, B. & Br. in Herb.

Pustulis ellipticis, epidermide nigricante nitido tectis, demum elongato-fissuratis (*Phyllachora subsimulans*). Peritheciis paucis, minutis, in collis brevibus attenuatis. Ascis clavatis, octosporis, $25 \times 5 \mu$. Sporidiis allantoideis, rectis vel curvulis, hyalinis, $4.5 \times 1 \mu$.

On palm spathe. Ceylon. (636.)

Nitschkia pauidia, *B. & C. Sphaeria pauidia*, *B. & C. in Herb.*

Peritheciis in acervulos minutos aggregatis (3-8), vel confluentibus, subglobosis, atris, opacis, epidermide fissurato erumpentibus. Ascis clavato-cylindraceis, sporidiis allantoideis, curvatis, continuis, hyalinis, $7-8 \times 2 \mu$.

On branches of *Melia*. S. Carolina. (1413.)

The following species require to be located :—

Ectostroma Liriodendri, *Schwein. Amer. Bor.* 1951.

Ectostroma annonæ, *Schwein. Amer. Bor.* 1951.

Ectostroma petiolaris, *Schwein. Amer. Bor.* 1955.

We have not succeeded in finding fruit in the specimens.

Dothidea exasperans, *Schw. Syn. Car.* 220. *Syn. Amer. Bor.* 1890.

Dothidea moriformis, *Schw. Amer. Bor.* 1867.

Seems to be a *Plowrightia*, with uniseptate sporidia about $10 \times 4-5 \mu$.

We have been unable to find any clue to descriptions of the following species from Schweinitz :—

Dothidea pandani, *Schw.*

On leaves of *Pandanus*. Surinam.

Dothidea lobata, *Schwein.*

On leaves. Surinam.

Dothidea aroidearum, *Schwein.*

On leaves of Aroids. Surinam.

Dothidea Horsfieldii, *Schwein.*

On leaf. Java.

Physalospora ventricosa (*DR. & M.*) *Dothidea ventricosa*, *DR. & Mont. in Herb. Berk.*

Peritheciis sparsis, innatis, tectis, globosis, atris, papillatis. Ascis clavatis, breviter stipitatis. Sporidiis ellipticis, utrinque apiculatis, hinc eumotiaeformibus, continuis, hyalinis, $15 \times 8 \mu$.

On stems of *Ricinus*.

Dothidea aspera, *DeNotaris in Herb. Berk.*

On *Ribes aureus*. Genoa.

Has asci, but the sporidia are immature. It has the habit of *Dothidea*. The trivial name appears to be *aspera*, but it is not distinct.

BERLESE, ICONES FUNGORUM.*

The second fasciculus, which Dr. A. N. Berlese has just issued, in continuation of his coloured figures of the Sphaeriaceæ, completes the Phaeophragmiæ. This work will be indispensable to all who devote themselves to the study of the Pyrenomycetes, because the figures are well executed, apparently characteristic, and have been drawn from authentic specimens of the species which they

* Icones Fungorum, ad usum Sylloges Saccardianæ accomodatæ Auct. A. N. Berlese. Fasc. II., 43 col. plates. Padua, 1892.

represent, and the measurements of the sporidia given, purport to be derived from original sources. We have often urged that systems may change, names may be superseded, but good and faithful representations, executed from authentic and well determined specimens, will last for ever. Whatever our individual opinions may be of the limits of genera or species, this does not affect the value of a work of this kind, which was worth doing, and worth doing *well*. We regret to observe so many illustrations of fungi in all orders, which have been issued of late years, failing in their object, because roughly or imperfectly executed, or because drawn from specimens not well authenticated. Our author has evidently appreciated these failures, and set himself at work to escape any such charge, and in this he seems to have succeeded. We wish him well in his useful and arduous undertaking, and trust that he will continue to pursue it in the same spirit to the close. At p. 86 is a rather long list of described species of *Leptosphaeria*, which at present could not be figured for lack of authentic material. Let us hope that mycologists will assist Dr. Berlese in his laudable enterprise, by communicating authentic specimens, so that many of these may yet find a place in the promised "Appendix."

OMITTED DIAGNOSES.

We have failed to trace the following species in Saccardo's "Sylloge":—

Puccinia agrostidis. *Plow. in Sydow Uredineen*, No. 408.

Puccinia andropogonis. *Fekl. Symb.* 59. *Fungi Eur.* 2175, 1891.
Thum. Myc. Univ. 1638. *Sacc. Myco. Ven.* 477, 478, 865.

Puccinia balsamorhizæ. *Peck. Bot. Gaz.* vi., 276.

Puccinia Bigelovii. *E. & E. in N. A. Fungi* 2248.

Puccinia callixines. *Berk. in Cooke Handbk. Austr. Fungi*, p. 409.

Puccinia cellulosa. *Berk. & Curt. Sphaeria canaliculata*, *Schwein.*

Teleutosporis fusiformibus, arete cohaerentibus, medio septatis, pallide fuscis, 28-30 \times 8 μ , episporio ad apicem incrassato, pedicellis brevibus, persistentibus.

Ad culmos *Cypero*. U.S.A.

Puccinia circinans. *Fekl. Fun. Rhen.* 1674.

Puccinia compacta. *Kunze. in Wiegelt's Exs.*

Surinam.

Puccinia concentrica. *Schwein. Amer. Bor.* 2918.

Puccinia confusa. *Burrill U. S. Fungi.*

Puccinia cryptica. *Cooke in Herb. Kew.*

Soris hypophyllis, sparsis, tomento denso tectis; teleutosporis lanceolatis, 50-60 \times 28-30 μ , fuscis; episporio crasso, laevi, ad apicem incrassatis et apiculatis, pedicellis longissimis (100 μ) hyalinis.

On leaves of *Stobæa*. Cape.

Puccinia cucumis. *Henn.*

Abyssinia.

Puccinia gregaria. *Kunz. in Wiegelt's Exs.*

Surinam.

Puccinia hysterina (Str.). *Rohl. Deut. Fl. 3, p. 131.*

Puccinia imperatoriae-sylvestris. *West. in Fun. Gallici 3713.*

Puccinia jurinæ. *Fekl. Fun. Rhen. 345.*

Puccinia lateritia. *Schwein. Journ. Acad. Sci. 1853, p. 281.*

Puccinia lamii. *Lib. in Fun. Gall. 1237.*

Puccinia Lecokiæ. *Kotschy. in Ung. et Kotsch. Ins. Cypern.*

Puccinia mesembryanthemi. *MacOwan.*

I.—*Fungus hymeniferus.* Acervulis plerumque cauliculis, sparsis, caulem sæpe cingentibus, aurantiacis, subiculo vix incrassato; pseudoperidiis confertis, cylindricis, circa .2 unc longis, ore tenui lacero; sporis globosis interdum subangulatis, diam. circa .00114 unc. dilute flavis, episporio lævi.

II.—*Fungus stylosporiferus.* Adhuc ignotus.

III.—*Fungus teleutosporiferus.* Pulvinulis cauliculis foliicolisve, sparsis, paucis, primo sub epidermide arescente tectis, tum hiantibus, lanceolatis, .5-2 lin. longis, fusco-atris, nitidis, dein erumpentibus, amorphis; sporis ellipticis, medio vix constrictis, longe pedicellatis, circa .0021 unc. longis, .001 latis; pedicello hyalino, fragili, .002-.0024 unc. longo, sursum incrassato, episporio lævi. apicem versus crassiore. (*P. MacOwan.*)

In caulibus foliisque vivis, *Mesembryanthemi micranthi.* Cape.

Puccinia pallido-maculata. *B. & E. N. A. Fungi, No. 2234.*

Puccinia recondita. *Rob. in Desm. Crypt. Exs. II., 252.*

Puccinia Schweinfurthii. *Henn.*

Abyssinia.

Puccinia solani. *Schwein Journ. Acad. Nat. Sci. (1853), p. 281.*

Puccinia Sydowiana. *Zopf. in Sydow. Myc. March. 40.*

Puccinia synedrellæ. *Lager. in Sydow. Ured. 376.*

Puccinia torosa. *Thum. Myc. Univ. 1725.*

Puccinia typhæ. *Kalch. in Rabh. Fun. Eur. 695.*

Puccinia vexans. *Plow. in Vize. M. F. Britt. 433.*

Puccinia Wrightii. *B. & C. in U. S. Expl. Exped.*

Uredo abietis-canadensis. *Farlow in N. A. Fungi, No. 1882.*

Uredo Cosmeæ. *Lowe.*

On *Cosmea leucantha.* Madeira.

Uredo cyclostoma. *Lec.*

On *Conyza.* Chili.

Uredo digitariæcola. *Thum. Myc. Univ. 2041.*

Uredo hyptidis. *B. & C. (? U. labiatarum).*

On *H. radiatum.* Santee River.

Uredo leguminum. *Desm. Crypt. Exs. 934.*

Uredo myrtacearum. *Pazs. in Fun. Eur. 3633.*

Uredo Peckii. *Thum. Myc. Univ. 538 (U. æcilioides. Peck.).*
U.S.A.

Uredo sphærospora. B. & C.

On *Panicum*. Pennsylvania.

Uredo terebinthinaceæ. Schwein. Syn. Car. 473.

Uredo fustulata. B. & C.

On *Cyperus*. Santee River.

Uredo Wrightii. B. & C.

On *Croton*. Texas.

Uredo Zorniae. Berk.

On *Zornia*. Mauritius.

Æcidium cassiæ. E. & K. in N. A. Fungi 1825.

Æcidium chelones. Gerard. Bull. Torr. Club v., 40.

Æcidium flustra. Berk.

On *Aster*, etc. Valparaiso. Natal.

Æcidium fædiæ. Bals. Erb. Critt. Ital. 597.

Æcidium hippophaes. Berk.

On *Hippophae*. Thibet.

Æcidium Hibisci. Cooke.

Hypophyllum; maculis indistinctis vel obsoletis; pseudoperidiis gregariis in cæspitibus suborbicularibus, plerumque circinantibus, semi-immersis, albidis, pro ratione minoribus; acidiosporis subglobosis, pallidis, 10-12 μ diam.

On leaves of *Hibiscus cannabinus*. Natal. (Wood, 3495.)

The colour of spores when living not stated, above description from dried specimens.

Æcidium phaceliæ. Peck. Bull. Torr. Club x1., 50. N. A. Fungi 2218.

Æcidium poterii (Grev.) Cooke Hdbk. p. 540.

Æcidium solanatum. Schwein. Journ. Acad. Nat. Sci. 11. (1853), 283.

Æcidium trachelifoliatum. Schwein. Amer. Bor. 2872.

THE MYXOGASTRES.*

When Rostafinski published his Monograph of these organisms, in 1875, it was supposed that the subject was settled, for some time to come. In Natural Science there is no such thing as finality, and it was not long before it was discovered that in this instance there was opportunity for improvement. Suggestions and emendations followed each other, without departing greatly from the systematic method adopted by Rostafinski, and now we are face to face with a "Monograph" which proposes a modification of that method. It will be remembered that, in the former, the primary divisions were the *Amurosporeæ*, with spores violet, or brownish violet, and the *Lamprosporeæ*, with spores diversely coloured, never violet. Each of these subdivisions were again subdivided into *Atrichæ*, sporangia without a capillitium, and *Trichophoræ*, sporangia constantly possessed of a capillitium. Under each of these the order, families, and genera were grouped. In his

* A Monograph of the Myxogastres, by George Massee, large 8vo, 12 coloured plates. London: Methuen & Co. 1892.

Monograph Mr. Masee has dispensed with this primary division, according to the colour of the spores, and proposes an arrangement, in harmony with his ideas of the relationship between the several orders, which may be represented as follows:—

- A. Wall of sporangium not incrustated with lime.
1. Capillitium absent, or formed from the wall of the sporangium PERITRICHÆ.
 Wall of sporangium not perforated *Tubulinæ*.
 Wall of sporangium perforated *Cribrariæ*.
 2. Capillitium originating from a central, usually elongated columella COLUMELLIFERÆ.
 Springing from every part of an elongated columella *Stemonitæ*.
 Springing from the apical portion of a short or elongated columella *Lamprodermæ*.
 3. Capillitium present, not springing from a columella CALOTRICHÆ.
 Threads free, not anastomosing to form a network *Tricheæ*.
 Threads attached by one end, with the free tips more or less branched, or combined to form an irregular network *Arcyriæ*.
- B. Wall of sporangium with an external deposit of lime. Capillitium present LITHODERMÆÆ.
 Threads without lime *Didymææ*.
 Threads containing lime *Physarææ*.

The value which is attached to this arrangement may be estimated from the following observations which occur in the Preface:—"Notwithstanding the excellent work initiated by the late Professor de Bary, and continued by Brefeld, Cienkowski, Woronin, Zopf, and others, the life history of the majority of forms is still unknown; hence all attempts at classification, as also the conception as to what constitutes a species, must be considered as tentative. When we are better acquainted with the main lines of development, and lines of variation, also the conditions of determining these variations, it is certain that the main factor in the discrimination of species will not be a one-twelfth oil-immersion objective."

Impressed with the feeling that, in the present condition of knowledge, the only safe guide to even a tentative arrangement, or a conception of the limits of species, is to be derived from the mature specimens contained in herbaria, our author has accepted these as his material, and reduced or constituted species, and genera, upon that basis. Hence he combines several, so-called, species in *Craterium* and *Baulhamia*, and interprets *Arcyria* as including *Hemiarcyria*, and *Stemonitis* as embracing *Comatricha*.

In order to inspire confidence in his determinations the preface gives a general announcement of the sources whence the types were derived, and especially "the splendid collection of Myxogastres in the Royal Herbarium, Kew, rich in types, and with numerous annotations by Rostafinski, who examined the collection in detail, and which, indeed, served as the basis for his excellent Monograph, also served me in like manner."

No one can doubt that Mr. Massee has gone to his task honestly, has worked all the material industriously, and has produced a conscientious volume, whether all his conclusions be accepted or not. There are 32 pages of "introduction," and probably the student will wish that it had been very much longer. There is but little suggestion of theory, and the absolute animal nature of the Mycetozoa is combatted by a few terse paragraphs. The summary is found in a few lines. "Undoubtedly the Myxogastres must be considered as a terminal group, and the very fact of this admission implies a certain amount of differentiation, in fact sufficient to give individuality to the group. I accept De Bary's reasoning as to the origin of the Myxogastres, and as an evolutionist am ready to extend the same reasoning to other groups, as having had a common origin from the lowest forms of life, where, owing to absence of differentiation, the ideas implied in the terms animal and vegetable respectively are not evolved, and I consider that the entire evidence as to the animal or plant tendency of any departure from this neutral starting-point consists of the aggregate tendency of the evolved features, which collectively constitute the characteristics of the group under consideration; and this tendency, as manifested by the Myxogastres, I consider to be in the direction of the vegetable kingdom, and more especially in the direction of the Fungi, for the following reasons, which, keeping in view the fact that we are dealing with a terminal group, and consequently can draw no comparisons from higher forms of the same type, we find it impossible to establish any strict homologies, and we are limited to the observation of resemblances in form, structure, and mode of life."

The nine reasons which follow may be left to be perused and reflected upon by those who use the volume.

Although we do not admire books of this particular size, which hardly harmonize with anything else, it certainly is good, clear reading, and both printer and publisher have done their duty. The coloured plates will be valuable, notwithstanding an amount of hardness and harshness in their execution which does not please the critical eye. We fear that we do not ourselves come up to the orthodox standard of a "reviewer," at least as interpreted practically in certain journals with which we are acquainted. The first, and almost the last, qualification seems to be the search after everything which can be magnified into a fault, and failing to secure sufficient for the purpose to imagine more, interspersed with a flavouring of personality. Our own more humble opinion of our

duty is to estimate the honesty of the work, the value of the volume to those for whom it is intended, and its scientific accuracy up to date. Having estimated this we are not anxious to search with microscopic eye, and bilious intent, for any little slip or error which might perchance be hidden in some obscure corner. Finally, therefore, we commend this volume to such of our readers as are interested in the Myxogastres, in full confidence that it will give them every satisfaction.

NEW BRITISH FUNGI.

By M. C. COOKE.

(Continued from p. 95.)

Valsa (Chorostate) biconica. *Currey.*

See Grevillea, xx., p. 82.

Didymella rubitingens. *Bloxam.*

See Grevillea, xx., p. 82.

Metasphæria rubida. *Bloxam.*

See Grevillea, xx., p. 83.

Myrothecium cinereum. *Cke.*

Receptacle somewhat cup-shaped, then flattened, discoid or irregular and confluent ($\frac{1}{2}$ m.m.), gregarious, disc dark cinereous, margin paler, connivent, extreme edge nearly white. Conidia cylindrical, rounded at the ends, 13-15 \times 3, hyaline, on long, simple, fasciculate sporophores.

On pseudobulbs of *Oncidium*. Bot. Gardens, Glasnevin.

Phoma Delphinii. *Rabh. in Fiedler's Exs.*

Sporules minute, 3-4 \times 2 μ .

On stems of *Delphinium consolida*. Norths.

MEMORABILIA.

M. CASIMIR ROUMEGUERE.—We regret to learn that the editor of "Revue Mycologique" died on the 29th February, 1892, at the age of 63 years. He has done some good work in his time, and amongst this for fourteen years conducted the "Revue," which he established.

FOMES ZEALANDICUS. *Cooke Grev. viii., 75. Sacc. Syll. No. 5414.*—This species was derived from Coromandel, in New Zealand, and not from India, as stated in "Sylloge."

FRACCHILEA BREVIARBATA, *B. & C., Sacc. Syll. No. 386,* was found on *Acer rubrum* in South Carolina, on bark in Ceylon, and on *Rhus copallina*, Santee Canal, S. Carolina.

POLYPORUS TALPÆ. *Cooke. Sacc. Syll. 5030.*—According to authentic specimen the species named *Polyporus Glaziovii*, Hennings, *Sacc. Syll. Suppl. 693*, is identical with *Polyporus talpæ*, Cooke.

BRESADOLA FUNGI TRIDENTINI.—This work, which was supposed to have been completed with Fasc. vii. and Index, has been resumed with the publication of Fasc. viii.-x., containing plates 106 to 150. We must say that *Morchella costata*, plate 148, hardly commends itself on its artistic merits.

HANDBOOK OF AUSTRALIAN FUNGI.

We are happy to announce that, concurrently with the issue of the present Journal, the long-anticipated "Handbook of Australian Fungi" will be completed, and bound in one volume, cloth, with gilt tops, containing some 500 pages of letter-press, an introduction, and 36 octavo plates, of which many are coloured, illustrating the genera and sub-genera. Only eighty copies of this work will be retained for sale in Europe and America, for which an early application should be made. The descriptions of the orders, genera, and species are in English, whilst the illustrations are drawn, as far as possible, from Australian species, hence a considerable number are now figured for the first time. The coloured plates are those of the Hymenomycetes, the Gastromycetes, and the Discomycetes. There are upwards of 2,000 species included, with a copious index, and the "introduction" is as full as necessary for the assistance of the student having little previous knowledge of the subject. It is hoped that this first "Handbook" of Colonial Fungi will gratify the Colonists, and give satisfaction to the respective Governments which have combined to assist in its production.

NEW BRITISH FRESH WATER ALGÆ.

Mr. W. West has recently published, in the "Journal of the Linnean Society," a list of the Fresh Water Algæ of West Ireland; and, in order to keep up a record of the British species in this Journal, we have extracted the new species, exclusive of Desmids and Diatoms, which will probably follow.

Coleochæte irregularis. *Prings. Mon. Ralh. Fl. Eur. Alg.* 390. *West p.* 108.

Thallus irregular, bright green, threads loosened, or connate in a parenchymatous stratum; joints quadrangular or polygonal, equal in length or $1\frac{1}{2}$ times as long; oogonia oval, irregularly disposed, for the most part naked.

SIZE. Veg. cell $12\frac{1}{2}$ -20 μ diam.

Lough Creggan; Roundstone.

Odogonium longicolle. *Nord. Alg. Aqu. dulc. Sandv.* 20, t. 2, f. 11-12. var. **Senegalense.** *Nord. Alg. et Char.* t. 16, f. 23. *West p.* 109.

Diæciuous, nannandrous (?). Oogonia 2-3, continuous or single, pyriformly globose, or depressedly globose, basal part elongated, opening by a pore in the middle, or a little above the middle.

Oospores depressedly globose, small males unicellular, inversely egg-shaped, small, seated on the oogonia, basal cell dilated and scutiform below.

SIZE. Veg. cell $4\frac{1}{2}$ μ diam., 3 times as long; oogonia $16-18 \mu \times 18-23 \mu$; oospore $16 \times 11 \mu$.

In lakes, ditches, etc. Upper Lake of Killarney.

Edogonium sueticum. *Wittr. Mon. Edog.* p. 30. *West* 109, t. 18, f. 2.

Oogonia single, globose to elliptical-globose, opening with a median pore; oospores filling the oogonia, globose, spiny with awl-shaped spines; male plants about the same thickness as the female; spermatogonia of 2-4 cells, seated in the upper part of the thread, terminal cell obtuse.

SIZE. Veg. cell $9-14 \mu$ thick, 4 to 6 times as long; oogonia $32-38 \times 36-40 \mu$; oospores (with spines) $31-37 \mu$ diam.

Ballynahinch.

Edogonium pilosporum. *West Linn. Journ.* 1892, p. 109, t. 18, f. 3.

Diocious? Oogonia single, oblong-ellipsoid, inflated, a little produced at each pole; oospores subglobose, membrane thick, and densely pilose with short hairs; basal cell similar to the others.

SIZE. Veg. cell $11-12 \mu$, 5-6 times as long; oogonia $23 \times 48 \mu$; oospore, without spines, $17 \times 18 \mu$, with spines, $19 \times 21 \mu$, membrane of oospore 2μ .

Arderry Lough.

The oospores showed indications of an apical operculum, but an open one was not seen.

Conferva stagnorum. *Kütz. Wille. Conf.* 20, t. 1, f. 12-27, t. 2, f. 50. *West* p. 111. *Microspora* (?) *stagnorum*. *Toni. Syll. Alg.* 229.

Tufts yellow-green, becoming paler; cells $5-9 \mu$ diam., 1-2 or rarely 3-4 times as long; membrane thick in proportion, hyaline; cysts elliptical or subglobose, nearly entirely filling the mother-cell.

SIZE. Filaments $8\frac{1}{2}-10 \mu$ diam.

Near Westport; Ballynahinch; Upper Lake of Killarney.

Conferva pachyderma. *Wille. Conf.* 20, t. 1, f. 28-35. *West* p. 111. *Microspora pachyderma*. *Toni. Alg.* p. 228.

Vegetative cells $9-12 \mu$ diam., $1\frac{1}{2}$ to 3 times as long as broad, with a thick membrane; persistent cells formed without any peculiar modification from the vegetative cells, ellipsoid or subglobose or quadrangular.

Derryclare Lough; South of Kenmare.

Conferva abbreviata. *Wille. Con.* p. 21, t. 2, f. 58, 59. *West* p. 111. *Microspora abbreviata*. *Toni. Syll. Alg.* 228.

Tufts floccose, floating, bright green, or for the most part coloured ferruginous ochre; vegetative cells shortly cylindrical, scarcely constricted, $5-10 \mu$ diam., $1\frac{1}{2}$ to 3 times as long, membrane homogeneous, hyaline, a little thickened.

Cloonee Lough.

Mougeotia elegantula. *Wittr. Om. Gall. Solv. Alg.* 40, t. 3, f. 5-8.
West p. 112.

Vegetative cells $4-4\frac{1}{2}$ μ diam., 15 to 30 times as long, copulating cells knee-shaped; spores 20-24 μ long and broad, 12-14 μ thick, cruciform, quadrate in front view, sub-elliptic with truncate apex in side view, mesospore hyaline, even, in front view quadrate, with angles a little rounded, side view oval.

Form. **microspora.** *West Linn. Journ.* t. 18, f. 17.

Vegetative cell 4 μ thick, 16 times as long. Spore 18 μ .
Creggan Lough.

Zygnema leiospermum. *DBary. Cooke F. W. Algæ* 82.

Form. **minor.** *West in Linn. Journ.*

Sterile cells and zygospores smaller. Vegetative cell 16-17 μ broad, $2-2\frac{1}{2}$ times longer. Zygospore 20-23 μ .
Cloonee Lough.

Form. **megaspore.** *West in Linn. Journ.*

Veg. cell, 27-28 μ thick, 2-3 times longer. Zygospore 40-45 μ diam.

Lough Shindilla.

Zygonium momoniense. *West Linn. Journ.* 114, t. 24, f. 26.

Sterile cells $1\frac{1}{2}$ -2 times as long as broad, connective tube much inflated; zygospores broadly elliptical (the long axis parallel to the filaments), membrane smooth.

SIZE. Veg. cell, 20-22 μ broad; zygospore, $30-33 \times 25-27$ μ .

Castletown.

This species differs from *Z. Ralfsii* in its larger size, its shorter sterile cells, and its much larger, differently shaped zygospores.

Staurogenia heterocantha. *Nord. in Wittr. et Nord. Alg. Exs.* 451.
West p. 189. *Toni Syll. Alg.* 656.

Cænobium of four cells, rounded, or broadly ovate-obcordate, angles (external) rounded, furnished with a spine, spines unequal, one (right) long, the other (left) about one-half shorter.

SIZE. Cells 4-8 μ without spines, with long spines 14 μ , short spines 8 μ .

Derryclare Lough.

Cælastrum verrucosum. *Reinsch. Cont. Alg. et Fung.* t. 13, f. 8. *West p.* 189. *Toni Syll. Alg.* 572.

Cænobium spherical, composed of 8 to 16 cells, measuring 45-56 μ diam.; cells spherical, 11 μ broad, membrane thick, externally covered with acute warts.

Adrigole.

Oocystis Nägelii. *Br. in Rabh. Fl. Eur. Alg.* III., 53. *West p.* 191.
Toni Syll. Alg. 663.

Families composed of 2 or 4 to 8 cells; cells rounded-ovoid or oblong before division, $30-40 \times 15-21$ μ ; membrane rather thick, not stratose.

S. of Kenmare.

Oocystis solitaria. *Wittr. in Nord. et Wittr. Alg. Exs.* 224. *West p.* 191. *Toni Syll. Alg.* p. 664.

Cells for the most part solitary, $13-35 \times 7-18 \mu$, sometimes associated in families of 2 to 4 cells, ellipsoid; membrane rather thick, with a small tubercle at each end.

Clifden.

Acanthococcus aciculiferus. *Lager. Bidr. Sver. Alg. Fl. t. 1, f.* 21. *West p.* 191.

Cells solitary, or collected in families, globose or subglobose, rarely oval, of variable size; membrane of the cells thick, densely clothed with very numerous spines.

Diam. without spines 20μ , with spines 26μ .

Cromagloun.

Acanthococcus sp. *West Linn. Journ.* 1892, 191, t. 18, f. 14.

Cells solitary, or conglomerate in small families, globose; membrane of the cells thick, furnished with numerous short, stout spines.

Diam. without spines $34-42 \mu$, spines $3-4 \mu$.

Burrew Hills, co. Clare.

Botryococcus calcareus. *West Linn. Journ.* 1892, t. 18, f. 6.

Thallus small, subglobose, of about 32 cells, free swimming, or aggregate in small masses; cells ovate, wedge-shaped, rather emarginate at the broader pole, with the narrow pole directed to the middle of the thallus.

SIZE. Fam. $30-55 \mu$ diam. Cells $9-12\frac{1}{2} \mu$ long, $10-12\frac{1}{2} \mu$ broad, $7\frac{1}{2}-10 \mu$ thick.

Amongst *Spirogyra* in small limestone pools. Burrew Hills, Co. Clare.

Differs from *B. Braunii* in the very different shape of the cells, and in not having them so densely packed.

Scenedesmus alternans. *Reinsch. Alg. Fl.*

Cells all equal, broadly elliptical to ovate-elliptical, rounded at the poles, twice as broad as long; families composed usually of eight cells, perfectly alternate.

Lough Shannacloontippen; near Oughterard; near Recess; Clifden; Carrantuohill; Adrigole.

Scenedesmus denticulatus. *Lagerh. Bidr. Stockh. Pedias. p.* 61, t. 2, f. 13-16. *West p.* 193. *Toni Syll. Alg.* 564.

Cœnobium of four cells, ovate or ovate-oblong, cruciately disposed, or subalternate, rounded at each pole, and furnished mostly with two teeth; membrane rather thick; pyrenoid central, $7-8 \times 5-11 \mu$.

Ballynahinch; Lough Shannacloontippen.

var. **lineatus.** *West t.* 18, f. 7.

Cells oblong, narrower, and arranged in one series, not cruciately or alternate, with 2-3 small teeth.

Cells $10-11 \mu$ long, $2\frac{1}{2}-4 \mu$ thick.

Derryclare Lough.

Polyedrium minimum. *Braun. P. pinacidium. Reinsch. Alg. Fl. p. 80.*

Cells in front view tetragonous, margins straight or slightly repand, angles rounded, obtuse, unarmed; cells from side view elliptical; cells half the thickness of the transverse diameter.

SIZE $6.9 \mu \times 3.6 \mu$.

Lakes Clifden to Roundstone; Oorid Lough; Derryclare Lough.

Polyedrium caudatum. *Lagerh. Bidr. Sver. Alg. Fl. West. p. 194. P. pentagonum. Reinsch. Alg. t. 3. f. 2.*

Cells pentagonal, margins repand to emarginate, angles obtuse, each armed with a single long, firm, hyaline spine.

Near Westport; Lakes east of Lough Bofin.

Anabæna (Sphærozyga) orthogona. *West Linn. Journ., 1892, p. 195, t. 18, f. 8.*

Trichomes nearly straight, dispersed, dissepiments constricted, pale æruginous, joints subquadrate; heterocysts globose; spores twin or single, large, rather rectangular, 3-4 times as long as broad.

SIZE. Veg. cells 5μ diam.; heterocyst $6.7\frac{1}{2} \mu$; adult spore $10.12 \mu \times 30.38 \mu$.

In peaty pools north of Cromagloun.

The vegetative cells generally appear distinct from each other, being apparently connected by the mucilage; the decidedly truncate spores, which are fully twice the diameter of the vegetative cells, are characteristic.

Scytonema calotrichoides. *Kütz. Rabh. Fl. Eur. Alg. II., 253. West p. 196.*

Tomentose-cæspitose, glaucous æruginous, trichomes stout, more or less curved, intricate, distinctly or indistinctly articulate, pseudo-ramuli for the most part in pairs, spreading, variously curved, joints about equal in length and breadth, æruginous, granular, not tornlose, terminal often uncoloured, never red; sheaths distinctly lamellose, colourless or spotted with yellow or pale brown; resting cells interspersed, oblong-cylindrical, hyaline.

SIZE. Without sheath $12\frac{1}{2}$ - 13μ diam.; with sheath 17.20μ diam.

S. of Kenmare.

Spirulina turfosa. *Cram. Hedwigia II., 61, t. 12, f. 1. West p. 198.*

Solitary, pallid æruginous, trichomes for the most part abbreviated.

Trichomes $4\frac{1}{2}$ - 5μ diam.

Near Westport.

Merismopædia æruginæa. *Breb. in Rabh. Fl. Eur. Alg. II., 57. West p. 199.*

Thallus somewhat limited and without colour. Families composed of 4-8-64 cells. Cells crowded, contents æruginous.

Cells $4\frac{1}{2}$ - 6μ diam.

Lakes Clifden to Roundstone.

Merismopædia irregulare. *Lagerh. Bidr. Sver. Fl. Alg. t. 1, f. 5, 6.*
West p. 199.

Families large, foliaceous-plicate and convolute, composed of numerous, remote or crowded, irregularly disposed small cells. Contents pale æruginous, not granulose.

Arderry Lough.

Glaucocystis nostochinearum. *Ilz. in Rabh. Fl. Eur. Alg. III., Add.*
p. 147. West p. 199.

Cells bounded by a hyaline limb, vesicles oblong, pallid, distinctly nucleolate.

Near Lough Brin; Carrantuohill; Glen Caragh.

Aphanothece saxicola. *Näg. Rabh. Fl. Eur. Alg. III., 63. West p.*
200.

Thallus gelatinous, colourless or becoming yellowish; cells sub-cylindrical, two or three times as long as broad, single or in pairs, girt with a loose tegument, contents pale greenish-blue.

Nacoogarrow Lough; Loughis Annierin and Creggan; Carrantuohill.

CLADOSPORIUM.

We fail to trace the following in Saccardo's "Sylloge," Vol. iv.:

Cladosporium apiculatum, *Berk. in Herb.*

On *Helianthus*. S. Carolina.

Cladosporium asperococcus, *Oud. Fungi Gallici 4592.*

Cladosporium cæspiticium, *Rabh. Fun. Eur. 579.*

Cladosporium chætomium, *Cke.*

On *Euphorbia*. U.S.A. (Ellis 2289).

Cladosporium diaphanum, *Thum. Myc. Univ. 1868.*

Cladosporium dracænatum, *Thum. Myc. Univ. 1869. Fungi Gall.*
4896.

Cladosporium epibryum, *C. S. Mass. in Grevillea.*

Cladosporium Fluggeæ, *Thum. Fun. Eur. 1571.*

Cladosporium fungorum, *Pers. Fun. Gall. 3293.*

Cladosporium fuscatum, *Link. Sp., p. 4.*

Cladosporium fusisporum, *B. & Curt.*

Cladosporium gleditschiæ, *Cke.*

Cladosporium graminum, *Link. Sp. p. 43.*

Cladosporium hirsutum, *Schwein.*

Cladosporium jasmini, *Schwein.*

Cladosporium microsporum, *Rabh. Itin. Crypt. 42. Fun. Gall.*
1426.

Cladosporium obtectum, *Rabh. Itin. Crypt.* 36. *Fun. Eur.* 2783.

Cladosporium pelliculosum, *B. & Curt.*

Cladosporium solutum, *Link. Sp.* p. 39.

Cladosporium subnodosum, *Cke. Rav. Fun. Amer.* 294.

Cladosporium subtile, *Rabh. Fun. Eur.* 2364.

Cladosporium ulmariae, *Grog. Fun. Gall.* 3697.

ENTOMOGENOUS FUNGI.

At length arrangements have been made for the publication of this work, which has been so long delayed. It will bear the title of "Vegetable Wasps and Plant Worms: A Popular History of Entomogenous Fungi, or Fungi Parasitic upon Insects," by M. C. Cooke, with numerous illustrations, uniform with the same author's "Toilers in the Sea." The whole of the letter-press is already in type, and it is only the illustrations which block the way. This is the almost universal "Bogie Man" at which publishers shudder, looking upon the cost as an unknown quantity. Such a work has never been published in this country before, although it has been much inquired after and desired, both by mycologists and entomologists, each of whom have an interest in it, but from different points of view. It is not anticipated that the cost will exceed six shillings, or that its issue will be delayed many weeks.

NEW ZEALAND FUNGI.

By M. C. COOKE.

Xerotus glaucophyllus. *Cke. & Mass.*

Pilei flabelliformi, tenui, plerumque sublobato, sulcato, glabro, opaco, siccitate atro ($1\frac{1}{2}$ - $2\frac{1}{2}$ c.m.), margine abrupte recurvo; lamellis paucis, distantibus, latis, acutis, venoso-connexis, pallide lateritiis, siccitate argillaceo-glauco-bus. Sporis globosis, 6 μ diam.

On twigs. New Zealand (*Colenso*, 1193).

Synchytrium melicopidis. *Cke. & Mass.*

Cellulis perdurantibus aggregatis, subconfluentibus, granuliformibus, violaceis (20-25 μ diam.), vulgo maculis orbicularibus, epiphyllis, atropurpureis insidentibus.

On leaves of *Melicope simplex*. New Zealand (*Colenso*, 1184).

NEW GENUS OF THELEPHOREI.

The following genus, of which the type was referred provisionally by Berkeley to *Thelephora*, is now proposed, for the reasons stated below :—

Nov. Gen. **ALDRIDGEA**, *Mass.*

Resupinate, effused, fleshy, subgelatinous when growing, cartilaginous, or rigid and collapsed when dry; hymenium smooth, even, basidia tetrasporous, spores continuous, smooth, elliptical, coloured.

Allied to *Coniophora* in the large, coloured spores, but distinguished by the subgelatinous consistency when growing. Distinguished from *Thelephora* by the smooth, elliptical spores.

Aldridgea gelatinosa, *Mass.*

Broadly effused, rather fleshy, subgelatinous, pallid, becoming collapsed, rigid, and purple-brown when dry; margin determinate; spores elliptical, obliquely apiculate, olive, $10 \times 6-7 \mu$.

On sawdust. Extending for several inches, the irregularities of the hymenium being due to the substratum.

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PERSONAL NOTICE.

In undertaking the responsibility of "*Grevillea*," an endeavour will be made to accomplish the desire expressed by the editor in the first volume; that of describing or recording new discoveries—especially British—in every section of Cryptogamic Botany, also by abstracts and notices, to indicate the results of work done in other countries, biological, morphological, and systematic. The expression of the above statement is justified by the promise of assistance from well-known specialists. Mr. E. A. L. Batters, LL.D., B.A., F.L.S., will take entire charge of the section devoted to *Algæ*. Each number will contain one or two plates, plain or coloured, as occasion may require.

GEO. MASSEE.

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SUPPLEMENT.

SERIES 1. LEUCOSPORI.

- 8 bis. **Agaricus (Amanita) solitarius.** Bull. Champ. t. 48.

Solita'rius = growing alone.

Pileus convex, then flattened, pelliculose, margin nearly even, warts angular, evanescent. Stem solid, equal, *imbricatedly squamose below*, bulb campanulate, *rooting*, margin inserted, ring torn, gills attenuatedly adnate.—*Fr. Hym. Eur.* p. 22. *Cooke Illus. Supp. t.* 939.

On the ground.

9. **Agaricus (Amanita) rubescens.** Pers.

See *ante* p. 8. *Cooke Illus. Supp. t.* 1163.

16. **Agaricus (Amanita) vaginatus.** Bull.

var. *nivalis.* Grev.

Cooke Illus. Supp. t. 940. See *ante* p. 10.

- 23 bis. **Agaricus (Lepiota) Friesii.** Lasch. Linn. III., No. 9.

Fries'ii, in honour of Elias Fries.

Pileus fleshy, soft, torn into *tomentose adpressed scales*. Stem hollow, with a web-like medulla, somewhat bulbous, squamose, ring superior, pendulous, equal. Gills rather remote, linear, much crowded, branched.—*Fries Hym. Eur.* 31. *Cooke Illus. Supp. t.* 941.

In a garden.

- 24 bis. **Agaricus (Lepiota) emplastrum.** Cke. & Mass. *Grevillea* XVIII., p. 51.

Emplastrum = plaister ; from the scales.

Pileus convex, then expanded (2-3 inches), silky, pallid, covered at first with a smooth, *membranaceous*, dark-brown *cuticle*, which splits up into large, adherent, plaister-like patches or scales, margin

smooth, naked. Stem equal, filbrillose (3 in. \times $\frac{1}{2}$ in.), fistulose, girt by a superior erect ring, with a marginal brown band. Flesh turning *pink* when cut, gills crowded, free, remote, narrowed behind, leaving a broad collar round the stem. Taste and smell, none. Spores apiculate at one end, nucleate, large, white.—*Cooke Illus. Supp. t.* 1164.

Gregarious, amongst grass in a churchyard.

Somewhat resembling *A. Badhami*, but scales smooth, and spores larger.

28 bis. *Agaricus (Lepiota) felinus.* *Pers. Syn. p.* 201. *Fr. Hym. p.* 32.

Felinus = of or belonging to a cat; from the coloration.

Pileus ovato-campanulate, then expanded, umbonate, submembranaceous, with a very dull, almost black centre, squamose, each minute scale being tipped with a black speck; margin striate, crenulate, thin, tender, and fragile; stem hollow, enlarged below; ring large, fragile, evanescent; gills white, free, subdistant, serrulate. Spores oval or oval-elliptical, 10×5 mill — *Cooke Illus. Supp. t.* 943 A.

In fir woods. Amongst moss.

Pileus $1\frac{1}{2}$ to $1\frac{3}{4}$ in. across. Stem $1\frac{3}{4}$ to 2 in. high, 1-2 lines thick.

31 bis. *Agaricus (Lepiota) micropholis.* *Berk. & Br. Journ. Linn. Soc. xi.*, 505.

Microph'olis, from $\mu\kappa\rho\delta\varsigma$ = small, and $\phi\omicron\lambda\acute{\iota}\varsigma$ = a scale.

Pileus conical, then flattened, white ($\frac{1}{2}$ in. broad), clad with minute radiating dark cinereous squamules, margin substriate, stem flexuous, nearly equal, white, ring erect, spreading. Gills white, ventricose, crowded, free. Spores 5μ long.—*Cooke Illus. t.* 943, f. B.

On cocoa nut fibre in a stove.

35. *Agaricus (Lepiota) cepæstipes.* *Sow.*

var. *cretaceus.* *Bulliard.*

Pileus chalky-white, with darker scales.—*Cooke Illus. Supp. t.* 942.

See *ante* p. 15.

Agaricus (Lepiota) citrophyllus. *Berk. & Br. Linn. Journ. xi.*, 509.

Citrophyllus = with citron-coloured gills.

Pileus obtuse, or broadly umbonate, at length depressed, lemon-yellow, clad with rufous scales; stem lemon-yellow, stuffed, then hollow, squamulose; gills ventricose, rounded behind or attenuated, approximate, lemon-yellow.—*Cooke Illus. Supp. t.* 639.

On the ground.

Agaricus (Lepiota) ianthinus. *Cooke Grevillea* XVI., p. 101.

Ianthinus = violet coloured.

Pileus rather fleshy, umbonate ($\frac{3}{4}$ in. broad), whitish at the even margin, disc dark violet, fibrillose, rest of pileus streaked with innate radiating, violet, hair-like squamules, stem slender, somewhat flexuous, nearly equal, whitish, soon hollow, girt about the middle with a narrow deciduous ring. Gills free, lanceolate, scarcely crowded, whitish.—*Cooke Illus. t. 944, f. A.*

In stove.

Agaricus (Lepiota) martialis. *Cke. & Mass. Grevillea* XVI., p. 101.

Martialis = warlike ; from the red colour.

Pileus thin, rather fleshy, silky pulverulent, campanulate, then expanded, dark fleshy red, with a tinge of ochre, darkest in the centre, margin striate, scarcely an inch broad, stem slender, erect, fistulose, smooth, $1-1\frac{1}{2}$ in. long, 1-2 lines thick, rufous and swollen at the base, ochraceous at the apex, with a broad pendulous rather distant ring. Gills free, somewhat lanceolate, rather crowded, whitish. Spores $8 \times 4 \mu$.—*Cooke Illus. t. 944, f. B.*

On tree fern in conservatory.

54 bis. Agaricus (Armillaria) Jasonis. *Cke. & Mass. in Grev. XVI., 77.*

Jasonis = of Jason ; from its golden fleece.

Cæspitose. Pileus rather fleshy, especially at the disc, campanulate, then expanded, with a distinct rounded umbo, granulatedly papillate, golden yellow, becoming reddish at the apex (3 in. diam.), margin appendiculate with the fibrous veil. Stem nearly equal, or a little thickened below (2-3 in. long, $\frac{1}{4}-\frac{1}{3}$ in. thick), of the same colour, squamose below the torn squarrose ring, which is rather distant ; hollow, gills adnate, scarcely crowded, thin, white, then pallid. Spores $8 \times 5 \mu$. Odour strong.

On stumps.

With just the habit of many species of *Pholiota*, but with white gills and spores.

52. Agaricus (Armillaria) focalis. *Fries.*

var. **Goliathus.** *Fries. Cooke Illus. Supp. t. 1165.*

See *ante* p. 21.

75 bis. Agaricus (Tricholoma) russula. *Schæff. Icon. t. 58.*

Russula, from its likeness and colour to some species of the genus *Russula*.

Pileus fleshy, convex, then depressed, obtuse, granulate, viscid, rosy flesh colour ; stem solid, firm, nearly equal, rosy, squamulose

at the apex ; gills rounded, then decurrent, rather distant, white, a little spotted with red. Taste mild.—*Fr. Hym. Eur.* 52. *Cooke Illus. Supp. t.* 926.

Under trees.

Pileus 3-4 in. Stem 3 in. ; $\frac{3}{4}$ in. thick. Spores elliptical.

76 bis. Agaricus (Tricholoma) variegatus. *Scop. Carn.* 434.

Variegatus = variegated ; from its coloration.

Pileus fleshy, soon flattened, dry, and, as well as the tough stuffed stem, *squamulose with reddish flocci* ; gills emarginate, crowded, pallid yellowish or whitish, edge equal, *quite entire*, of the same colour.—*Fr. Hym. Eur.* 53. *Cooke Illus. Supp. t.* 642.

On rotten wood.

Smaller and more slender than *A. rutilus*, from which it can scarcely be separated as a distinct species. In the specimens collected the stem was pallid yellowish and scarcely floccose, the gills whitish.

80. Agaricus (Tricholoma) argyraceus. *Fries.*

var. **virescens.** *Wharton.* *Cooke Illus. Supp. t.* 641.

var. **chrysites.** *Jungh.*

Chrysi'tes, χρυσίτης, like gold.

Cooke Illus. Supp. t. 947. See *ante* p. 30.

83 bis. Agaricus (Tricholoma) inodermeus. *Fr. Hym. Eur.* 57.

Inodermeus, from ἴς, gen. ἰνός, a nerve or fibre, and δέρμα = the skin ; from the fibrils of the pileus.

Pileus fleshy, thin, conic, then campanulate, at length convex, umbonate, torn into fibrils and variegated with radiating scales, fuscous turning reddish, stem somewhat stuffed, white, then reddish, sprinkled with white meal at the apex ; gills free, broad, distant, white, spotted with red when touched.—*Cooke Illus. Supp. t.* 945,

In grassy places.

99 bis. Agaricus (Tricholoma) fallax. *Peck 25 Report, t.* 1, *f.* 5-8.

Fallax = deceptive.

Pileus firm, convex, expanded, rarely depressed in the centre, moist, smooth, yellow (sometimes rufous at the disc), about 1 in. diam. Stem short, smooth, yellow, stuffed, then hollow, sometimes attenuated at the base (1 in. long). Gills rounded behind,

crowded, white, then yellowish. Spores 4-5 μ long, ovate.—*Cooke Illus. Supp. t. 1151 A.*

Under firs.

105 bis. Agaricus (Tricholoma) borealis. *Fries Hym. Eur. 67.*

Borealis = of the north.

Pileus fleshy, irregular, rather umbonate, smooth, rivulose when dry, *flesh coloured*, growing pale, margin even, naked; stem solid, *elastic*, unequal, often twisted, attenuated at the base, gills emarginate, decurrent, thin, crowded, white.—*Cooke Illus. Supp. t. 956.*

In grassy places.

With the odour and habit of *A. prunulus*.

106 bis. Agaricus (Tricholoma) pes-capræ. *Fries Hym. Eur. 68.*

Pes-capræ = with a foot like a goat's.

Pileus fleshy, thin, *conical, then expanded, unbonate*, fragile, unequal, grey, turning brownish, smooth, margin cracked, at length split; stem solid, equal (or attenuated at the base), smooth. Gills emarginate, broad, crowded, then rather distant, white, becoming cinereous.

In open places.

var. **multiformis.** *Schæff. Cooke Illus. Supp. t. 946.*

Multi-formis = of many shapes.

115. Agaricus (Tricholoma) duracinus. *Cooke.*

Cooke Illus. Supp. t. 640. See *ante* p. 40.

121. Agaricus (Tricholoma) melaleucus. *Fries.*

var. **polioleucus.** *Fries Hym. Eur. 75.*

Polio-leucus = greyish white.

Pileus obtusely umbonate, livid, then grey, stem nearly equal, whitish, pruinose at the apex, gills whitish.—*Cooke Illus. Supp. t. 957.*

In grassy places.

151 bis. Agaricus (Clitocybe) amplus. *Pers. Syn. 359.*

Amplus = full, large.

Pileus fleshy, convex, then plane, somewhat repand, fragile, *becoming even*, rather hygrophanous, disc compact, margin thin,

naked, soon spreading and reflexed; stem solid, stout, rather cartilaginous, naked, white, a little villous at the apex; gills decurrent, rather crowded, broad, fuliginous, then dirty white.—*Fr. Hym. Eur.* 89. *Cooke Illus. Suppl. t.* 644.

In woods.

155 bis. Agaricus (Clitocybe) fumosus. Pers.

var. **cæspitosus.** *Cooke. Cooke Illus. Suppl. t.* 645.

Cæspitosus = growing in tufts.

152 bis. Agaricus (Clitocybe) subdecastes. Cke. & Mass.

Sub-decastes, from its near relation to *Ag. decastes*.

Cæspitose. Pileus fleshy, campanulate, convex, obtuse, even, smooth, white at the margin and somewhat lobed, becoming yellow at the apex, disc compact, elsewhere thin, stem solid, confluent at the base, smooth, equal, fibrillose (5 in. long $\frac{1}{2}$ – $\frac{2}{3}$ in. thick). Gills broad, rather crowded, attenuated in front, rounded behind, white, spores globose, 4–5 μ .—*Cooke Illus. Suppl. t.* 958.

On the ground.

Pileus $2\frac{1}{2}$ in. broad, and high; stem 5 in. long, $\frac{1}{2}$ – $\frac{2}{3}$ in. thick.

157. Agaricus (Clitocybe) pergamenus. Cooke.

Cooke Illus. Suppl. t. 643. See *ante* p. 52.

160. Agaricus (Clitocybe) monstrosus. Sow.

Cooke Illus. Suppl. t. 648. See *ante* p. 58.

163. Agaricus (Clitocybe) infundibuliformis. Schæff.

var. **membranaceus.** *Fries. Cooke Illus. Suppl. t.* 646.

Membranaceus = of skin or membrane.

165 bis. Agaricus (Clitocybe) sinopicus. Fries Hym. Eur. 95.

Sinopicus = of Sinope, in Patagonia, where *minium* (red-lead) was found; from the red pileus.

Pileus fleshy, thin, plane, then depressed, umbilicate, dry, at length flocculosely rivulose, stem stuffed, equal, rather fibrillose; gills decurrent, very crowded, rather broad, pure white, then turning yellowish.—*Cooke Illus. Suppl. t.* 647.

In woods, chiefly on burnt places.

167 bis. Agaricus (Clitocybe) spinulosus. Stevenson.

Spinulo'sus, from the "spinulose" spores.

= *Agaricus geotropus* v. *subinvolutus*. * Smith. *Cooke Illustrations*, Vol. ii., t. 177.

See *ante* p. 55.

172 bis. Agaricus (Clitocybe) vermicularis. Fr. Hym. Eur. p. 98.

Vermicula'ris, from *vermiculus* = the scarlet worm, in the Vulgate, Exodus xxxv. 25.

Pileus slightly fleshy, umbilicate, then reflexed, infundibuliform, repand, even, smooth, moist, becoming pale; stem hollow, soon compressed, smooth, shining, and, as well as the decurrent, very crowded thin gills; white.

In pine woods.

Somewhat fragile; pileus of a beautiful red or flesh-colour, then tan (almost hygrophanous). Mostly frequently undulate-lobed.

177 bis. Agaricus (Clitocybe) cinerascens. Batsch.

Cinerascens = becoming ash-coloured.

Smaller than *Ag. cyathiformis*. Pileus thin, plane then depressed gills white, turning yellowish. Stem fibrillose, reticulate.—*Cooke Illus. Supp. t. 115 B.*

On the ground.

182 bis. Agaricus (Clitocybe) zygophyllus. Cooke & Mass. Grev. xv., 67.

Zygo-phyllus, from ζυγόν = a yoke, from the connected gills.

Pileus rather fleshy, convex, then expanded, disc depressed, hygrophanous, tough, flaccid, pallid, with a greyish tint when moist, ochraceous white when dry, margin thin, at first involute, rugose or *plicate*, as if pinched up at regular intervals, stem equal, stuffed, spongy, white, expanding into the pileus, even, smooth, with a thin white tomentum at the base; *gills deeply decurrent*, rather distant, distinctly *connected by veins*, cinereous. Spores elliptical ($8 \times 4 \mu$). *Cooke Illus. Supp. t. 948.*

Amongst leaves.

Pileus 2-4 in. diam. Stem 2 in. long, $\frac{1}{4}$ - $\frac{1}{2}$ in. thick.

198 bis. Agaricus (Collybia) fodiens. Kalch. Icon., t. 36, f. 2.

Fod'iens = digging up, piercing; from the character of the root.

Pileus fleshy, firm, convex, obtuse, margin inflexed (2-3 in.), even, smooth, flesh colour, becoming yellowish, darker and gilvous in the centre. Stem hollow, tough, somewhat ventricose, often longitudinally costate (2 in. long, 5-6 lines thick), attenuated into a rooting base of equal length, or longer, deeply immersed in the

ground, smooth, white. Gills rounded, emarginate, crowded, narrow, yellowish-white.—*Cooke Illus. Suppl. t. 949.*

On grass borders.

199 bis. Agaricus (Collybia) proluxus. *Fl. Dan. t. 1608.*

Proluxus = stretched far out, broad.

Pileus fleshy, convex, then flattened, gibbous, large, even, smooth; stem solid, rather stout, nearly equal, abrupt at the base, sulcate, brick red; gills free, crowded, quite entire, white, unspotted.—*Fries. Hym. Eur. 113. Cooke Illus. Suppl. t. 950.*

Amongst dead leaves, &c.

Pileus 2-3 in. Stem 4 in. long; $\frac{1}{2}$ in. thick.

199. Agaricus (Collybia) distortus. *Fries.*

See *ante* p. 64.

var. *Cooke Illus. Suppl. t. 652.*

202. Agaricus (Collybia) velutipes. *Fries.*

var. *rubescens. Cooke.*

Rubescens = becoming reddish.

Pileus *viscid*, about an inch, bright ferruginous brown, obscurely striate, stem as in the type, velvety dark brown, internally becoming blackish below, white above; gills *becoming spotted with brown*.—*Cooke Illus. Suppl. t. 650.*

Amongst fir leaves.

203 bis. Agaricus (Collybia) floccipes. *Fries Hym. Eur. 116.*

Floc'cipes = with a floccose, wool-like, stem.

Pileus rather fleshy, campanulate, then convex, umbonate, even, growing pale; stem fistulose, straight, rooting, pallid, *rough with black punctiform floccose scales*; gills adnexed, ventricose, rather distant, thick, white.—*Cooke Illus. Suppl. t. 1168.*

On the ground, and about trunks.

214 bis. Agaricus (Collybia) thelephorus. *Cke. & Mass. Grev. XVIII., p. 51.*

Thele'phorus, from $\theta\eta\lambda\eta'$ = the nipple, and $\phi\acute{\epsilon}\rho\omega$ = I bear; from the umbo.

Pileus rather fleshy, campanulate, with an acute mammillate umbo (1 to $1\frac{1}{2}$ inch diam.), ochraceous, becoming darker and fuliginous at the apex, margin at first incurved, then repand, faintly striate. Stem cylindrical, equal, hollow, purple at the base, paler

at the apex (3-4 in. long), slender, smooth. Gills broadest behind, adnate, rather crowded, spores.—*Cooke Illus. Supp. t. 1167.*

In peat bogs.

Near ally to *Ag. collinus*.

215 bis. *Agaricus (Collybia) leucomyosotis.* Cooke and Smith Grev.

Leuco-myoso'tis, from λευκός = white, and *Ag. myosotis*.

Pileus convex, then expanded, sometimes obtusely umbonate, pale mouse-coloured, disc darker, paler at the margin, whole plant becoming pallid, almost white when dry, *strong scented*, rather fragrant, margin faintly striate, stem hollow, very brittle, slightly pruinose above, pallid, white at the base, and obtuse. Gills thick, moderately distant, adnate, sinuate behind, white. Spores elliptic (0.006×0.004 mm.).—*Cooke Illus. Supp. t. 651.*

On Sphagnum, in bogs.

Pileus about an inch. Stem reaching to 4 or 5 inches, about 2 lines thick. Habit very much resembling the figure in Fries' *Icones* of *Ag. (Naucoria) myosotis*, hence the name.

223. *Agaricus (Collybia) tenacellus.* Pers.

Cooke Illus. Supp. t. 640. See *ante* p. 70.

250 bis. *Agaricus (Mycena) olivaceo-marginatus.* Massee.

Olivaceo-marginat'us = with olive margins.

Pileus membranaceous, campanulate (about $\frac{1}{2}$ in. broad and high), tawny honey colour, striate up to the disk, darker when dry; stem fistulose, smooth, shining, naked, dry, slender (about 2 in. long), tinged with rufous at the base, with a little white cottony tomentum; gills rather distant, adnexed, uncinat, broad, slightly connected by veins, pallid, with the edge brownish olive, wholly greyish when dry. Spores $6 \times 5 \mu$.—*Cooke Illus. Supp. t. 959 A.*

On lawns.

255 bis. *Agaricus (Mycena) flavipes.* Quelet. Jura II., t. 1, f. 4.

Flavi-pes = with a yellow stem.

Pileus membranaceous, campanulate, striate, diaphanous, smooth, violet or purplish pink, disc becoming brownish; stem tough, shining, pellucid, *yellow*, villous at the base; gills uncinat, adnate, connected by veins, distant, white, then rosy fresh-colour; odour raphanoid. Spores $7 \times 4 \mu$.—*Cooke Illus. Supp. t. 951 B.*

On stumps.

- 260 bis. Agaricus (Mycena) gypseus.** *Fries. Hym. Eur.* 135.

Gyps'us = of gypsum (plaster of Paris).

Cæspitose. Fragile; pileus membranaceous, conico-campanulate, smooth, striate to the umbo; stem straight, attenuated upwards from the hairy base, smooth above; gills attenuated behind, adnexed, somewhat uncinat, broadest in front, white.—*Cooke Illus. Supp. t.* 952 A.

On stumps.

Stem 2-3 in. long, hyaline white, with the disc turning yellowish.

- 287. Agaricus (Mycena) mirabilis.** *C. & Q.*

Cooke Illus. Supp. t. 951 A. See *ante* p. 85.

- 301. Agaricus (Mycena) leucogalus.** *Cooke.*

Cooke Illus. Supp. t. 653. See *ante* p. 88.

- 315 bis. Agaricus (Mycena) codoniceps.** *Cooke Grevillea XVI.*
p. 102.

Codoniceps, from its head (pileus) being like a bell (κώδων) in shape.

Minute, pileus campanulate, scarcely expanding, sulcate, sprinkled with somewhat erect short hairs, wholly umber (about 1 line broad, 2 lines high), stem attenuated downwards, umber below, whitish above, slender (nearly $\frac{1}{2}$ in. long), gills adnate, linear, not crowded, white. Spores 5 μ long.—*Cooke Illus. t.* 952, f. B.

On tree fern stems.

- 323. Agaricus (Omphalia) chrysophyllus.** *Fries.*

Cooke Illus. Supp. t. 1152 A. See *ante* p. 92.

- 324. Agaricus (Omphalia) Postii.** *Fries.*

var. *Cooke Illus. Supp. t.* 1152 B. See *ante* p. 93.

- 333. Agaricus (Omphalia) glaucophyllus.** *Lasch.*

Cooke Illus. Supp. t. 959 B. See *ante* p. 94.

- 334. Agaricus (Omphalia) rusticus.** *Pers.*

Cooke Illus. Supp. t. 959 C. See *ante* p. 95.

365. Agaricus (Pleurotus) Ruthæ. Berk. & Br.

Cooke Illus. Supp. t. 654. See ante p. 103.

Veil none, gills very decurrent, stem distinct, almost vertical.

368 bis. Agaricus (Pleurotus) sapidus. Kalchb. Icon. t. 8, f. 1.

Sapidus = tasty, savoury.

Cæspitose. Pileus fleshy, somewhat excentric, deformed, smooth, depressed in the centre. Stem solid, connate at the base, smooth, white. Gills decurrent, rather distant, white. Spores $10 \times 4-5 \mu$.—*Cooke Illus. Supp. t. 954.*

On elm trunks.

Pileus white or brownish, flesh always white.

370 bis. Agaricus (Pleurotus) ostreatus. Fr.

var. *columbinus. Bresadola.*

Columbinus = dove-like (in colour).

Pileus fleshy, irregular, subrotund, margin involute, plano-convex, gibbous, then umbilicate, margin pigeon-coloured blue, centre rather flesh colour, becoming yellowish, smooth (6-10 cm.), umbo or umbilicus whitish pilose, stem excentric, lateral, strigose, variable in length (to $1\frac{1}{2}$ cm. thick). Flesh white. Gills crowded, broad, attenuato-decurrent, anastomosing behind, glaucous, edge entire, or delicately fimbriate under a lens. Spores hyaline, ovate oblong, trinucleate ($10-12 \mu$).—*Pleurotus columbinus*, Quelet, in Bresadola Fungi Tridentini, t. vi. *Cooke Illus. Supp. 953.*

On stumps.

SERIES 2. HYPORHODII.

409 bis. Agaricus (Pluteus) salicinus. Pers. Syn. 344.

Salicinus = of or belonging to a willow, *Salix*.

Pileus rather fleshy, convexo-plane, rather umbonate, *disc darker, floccose-rugose*; stem stuffed, fibrillose, *blue, becoming whitish*; gills free, rose colour.—*Cooke Illus. t. 1169 A.*

On willow trunks.

Pileus 1 in. or more broad, blue, then cinereous.

439 bis. Agaricus (Entoloma) nigrocinnamomeus. Kalch. Icon. Hung. t. XI., f. 1.

Nigro-cinnamomeus = blackish cinnamon, in colour.

Pileus slightly fleshy, convex, then flattened, *depressed about the umbo, even, smooth, umber, becoming blackish*; stem hollow, rather

twisted, fibrillose, grey, becoming tawny; gills soon receding, rounded, distant, reddish cinnamon.—*Cooke Illus. Supp. t. 1153.*

In pastures, etc.

Gregarious. Odour of fresh meal. Pileus 2.4 in. broad, tough.

p. 128, after No. 453 add :

SERICELLI. Pileus regular, silky, or hygrophanous, then silky, margin involute, naked. Gills adnate, slightly decurrent.

454 bis. Agaricus (Clitopilus) straminipes. *Massee. Grevillea*
xvi., 43.

Stramin'i-pes, with a foot like straw, *stramen*.

Pileus thin, submembranaceous fragile, convex, then expanded, and depressed, whitish, even, rather shining (1-2 in.). Stem equal, hollow, smooth, often compressed, straw-coloured below, sprinkled with white meal above (2 in. long, 2 lines thick). Gills scarcely crowded, shortly decurrent, whitish, then rosy. Spores irregularly globose, nodulose, pink, 10-12 μ .—*Cooke Illus. Supp. t. 960.*

On the ground.

469. Agaricus (Leptonia) asprellus. *Fries Hym. Eur.*

Cooke Illus. Supp. t. 1169 B. See *ante* p. 132.

476 bis. Agaricus (Nolanea) nigripes. *Fries Hym. Eur. 207.*

Nigri-pes = with a black foot or stem.

Pileus rather membranaceous, conical, then campanulate, obtuse, without striæ, fuscous, *clad with paler flocci*; stem fistulose, twisted smooth, *black*; gills nearly free, thin, ventricose, yellow, then flesh colour.—*Cooke Illus. Supp. t. 1170 A.*

In swamps.

Stem 4-5 in. long. Pileus 1½ in. broad.

478 bis. Agaricus (Nolanea) subglobosus. *Alb. & Schw.*

Sub-globo'sus = almost spherical.

Pileus rather fleshy, hemispherical, even, rather viscid, yellowish (about 2 cm. broad), stem thin, becoming hollow, equal, short (1½ in. long), longitudinally striate; gills very broad, nearly free, rhomboidal, convex, ochraceous flesh-colour. Spores spheroidal

(9 × 7 μ), pale salmon-colour.—*Cooke in Grevillea* xvii., 38.
Cooke Illus. Supp. t. 1170 B.

On the ground.

SERIES 3. DERMINI.

516 bis. *Agaricus (Pholiota) molliscorium*, Cke. & Mass. Grev. xvii., p. 1.

Mollis-corium = with a soft, leather-like skin.

Pileus fleshy, convex, then plane, obtuse, at length depressed, even, smooth, soft like kid leather, tawny yellow; disc darker, dry, shining (2-3 in. broad); margin acute, thin; stem equal, paler, erect, fistulose (3 in. long, $\frac{1}{4}$ - $\frac{1}{3}$ in. thick), silky, punctately squamulose at the apex; ring broad, distant, brownish, deciduous; flesh yellow; gills narrowly adnate, ventricose, crowded, thin, ferruginous; spores elliptical, smooth, ferruginous, 12 × 5-6 μ .—*Cooke Illus. Supp. t.* 1171.

On the ground.

Taste and smell none. Habit that of *A. praeox*, with which it was associated, but differing in the yellow colour and the bright ferruginous gills. Near to *Ag. ombrophilus*, Fr.

500 bis. *Agaricus (Pholiota) blattarius*. Fries Hym. Eur. 216.

Blatta'rius = like a cockroach (*blatta*).

Pileus rather fleshy, soon flattened, somewhat umbonate, smooth, ferruginous, hygrophanous, *margin striate*, stem fistulose, equal, straight, ring entire, distant, white, gills, *free, rounded*, ventricose, crowded, watery cinnamon.—*Cooke Illus. Supp. t.* 1172 A.

In gardens and cultivated places.

557 bis. *Agaricus (Inocybe) perlatius*. Cooke Grev. xv., p. 40.

Perlatius = very broad.

Pileus fleshy, convex, then expanded, broadly umbonate, longitudinally fibrous (3-4 in. diam), with darker fibrils, fuscous, margin paler, incurved, disc *dark, bistre nearly black*; stem solid, equal, straight or curved, sometimes twisted (3-4 in. × $\frac{1}{2}$ - $\frac{3}{4}$ in.), striate, dark below when old, pallid and mealy above, flesh dirty white; gills adnexed, somewhat rounded behind, rather broad, pallid, then umber. Spores elliptical, smooth, rather irregular.—*Cooke Illus. Supp. t.* 961.

On the ground.

- 543 bis. Agaricus (Inocybe) violaceo-fuscus, Cke. & Mass. Grevillea XVII., 52.**

Viola'ceo-fuscus = of a dusky violet colour.

Subcæspitose. Pileus convex, expanded, obtusely umbonate (1-2 in. diam.), flocculose, fibrillose, concentrically squamose, dry umber, margin thin, torn, and fimbriate, stem solid ($2-2\frac{1}{2} \times \frac{1}{4}$ in.), violet above, within and without, pallid below, smooth or silky, equal, flesh pallid when old. Gills broad, scarcely crowded, adnate or emarginate, violet, then umber, margin paler, serrulate. Veil at first whitish. Spores smooth, $7-8 \times 4 \mu$.—*Cooke Illus. Supp.* 1174.

Amongst grass, in open places.

- 544 bis. Agaricus (Inocybe) fasciatus. Cke. & Mass. Grevillea XVIII., 52.**

Fasciatus = bound together as if in bundles.

Cæspitose. Pileus campanulate-convex (2-3 in. diam.), tawny, rufous at the disc, silky, clad with minute, darker, squarrose scales, flesh thin, stem slender, equal, or a little attenuated below (2-3 in. long), fibrillose, solid, reddish within and without at the base, pallid above. Gills crowded, attenuated in front, rounded behind, or slightly sinuate, thin, soft, pallid. Spores rough, $10 \times 6 \mu$. Odour and taste, none.—*Cooke Illus. Supp. t.* 1173.

On the ground.

- 591. Agaricus (Hebeloma) elatus. Batsch Elen. f. 188.**

Cooke Illus. Supp. t. 962. See ante p. 164.

- 595 bis. Agaricus (Hebeloma) nauseosus. Cke. Grevillea XVI., 43.**

Nauseosus = rank-smelling.

Fœtid. Pileus convex, gibbous, more or less expanded, even, smooth, viscid, ochrey-white ($1-1\frac{1}{2}$ inch across). Stem equal, or slightly attenuated below, of the same colour, mealy above, faintly striate downwards, and in decay turning black at the base, solid. Gills ventricose, sinuate behind, very broad, rather distant, pallid, then clay-coloured, at length ferruginous. Spores large, attenuated towards each end, $20 \times 10 \mu$.—*Cooke Illus. Supp. t.* 963.

On the ground in mixed woods.

The odour is very strong and abominable, especially after being kept for a night in a box.

601 bis. Agaricus (Flammula) purpuratus. Cke. & Mass. *Grevillea* XVIII., 73.

Purpuratus = purpled.

Pileus rather fleshy, convex, then expanded, obtusely umbonate (1-2 in. diam.), purple or purple-brown, clad with minute floccose scales of the same colour, stem curved, ascending, equal (1-2 in. long, 2-3 lines thick), smooth and pallid above, purple below, and granulose, solid, flesh pale yellowish above, purplish below, ring fibrillose, gills adnate, somewhat rounded behind, not crowded, lemon-yellow, at length bright ferruginous ($8 \times 5 \mu$). Taste very bitter.—*Cooke Illus. Supp. t. 964.*

On tree fern stems.

601 bis. Agaricus (Flammula) nitens. Cke. & Mass. *Grevillea* XVIII., 52.

Nitens = shining.

Cæspitose. Pileus hemispherical, convex, then expanded, obtuse (1-1½ in. diam.), shining, dry, somewhat silky, purple brown, stem (2-3 in. \times ½ in.) equal, solid, flesh coloured, fibrillose. Gills crowded, adnate, margin entire, pallid, thenumber. Spores almond-shaped, pale brown ($10 \times 5-7 \mu$).—*Cooke Illus. Supp. 1154.*

On the ground.

631. Agaricus (Naucoria) festivus. Bolt.

Cooke Illus. Supp. t. 966.

631 bis. Agaricus (Naucoria) obtusus. Cke. & Mass. *Grevillea* XVIII., 52.

Obtus = bluntened.

Pileus campanulate, obtuse, smooth, becoming faintly striate about the margin, rufous, becoming paler (not much exceeding an inch broad and high); stem equal, fistulose, flesh-colour, darker within, especially at the base (2 in. \times ¼ in.), smooth. Gills broadly adnate, or with a tooth, broad, ventricose, with a serrate edge. Spores rubiginous, $7-8 \times 4 \mu$.—*Cooke Illus. Supp. 1155.*

On the ground.

Allied to *Ag. Christinae*.

632. Agaricus (Naucoria) hamadryas. Fries *Hym. Eur.* 254

Cooke Illus. Supp. t. 965. See *antè* p. 174.

- 648 bis. Agaricus (Naucoria) nasutus.** *Kalch. Grev. VIII., 152, t. 142, f. 9.*

Nasutus = with a conspicuous nose (or umbo).

Pileus thin, rather fleshy, campanulate, terminated by a long papillæform umbo, margin striate or sulcate, smooth, ochraceous. Stem fistulose, equal, flexuous fibrillose, rather ferruginous; gills emarginate, with a decurrent tooth, somewhat crowded, broad, ventricose, ferruginous.—*Cooke Illus. Supp. 1172 B.*

In swampy places.

- 673 bis. Agaricus (Galera) siligineus.** *Fries Hym. Eur. 267.*

Siligineus = of wheat, wheaten (like bread).

Pileus membranaceous, globose-campanulate, then expanded, unequal, even, not turning pale; stem rather flexuous, equal pallid, somewhat pruinose; gills adnate, broadly linear, rather crowded, ochre.—*Cooke Illus. Supp. 1156.*

On road scrapings.

The variety figured turns pale when dry, thus differing from the type.

- 690. Agaricus (Tubaria) pellucidus.** *Bull. Champ. t. 550, f. 2.*

Cooke Illus. Supp. t. 1175 A. See *ante* p. 188.

- 690 bis. Agaricus (Tubaria) muscorum.** *Pers. Syn. 470.*

Muscorum = of mosses (*musci*).

Pileus membranaceous, convex, depressed in the centre, striate, smooth, tawny yellow; stem fistulose, short, of the same colour, incrassated at the base, gills rather decurrent, horizontal, paler.—*Fries Hym. Eur. 274. Cooke Illus. Supp. t. 1175 B.*

Amongst moss on heaths.

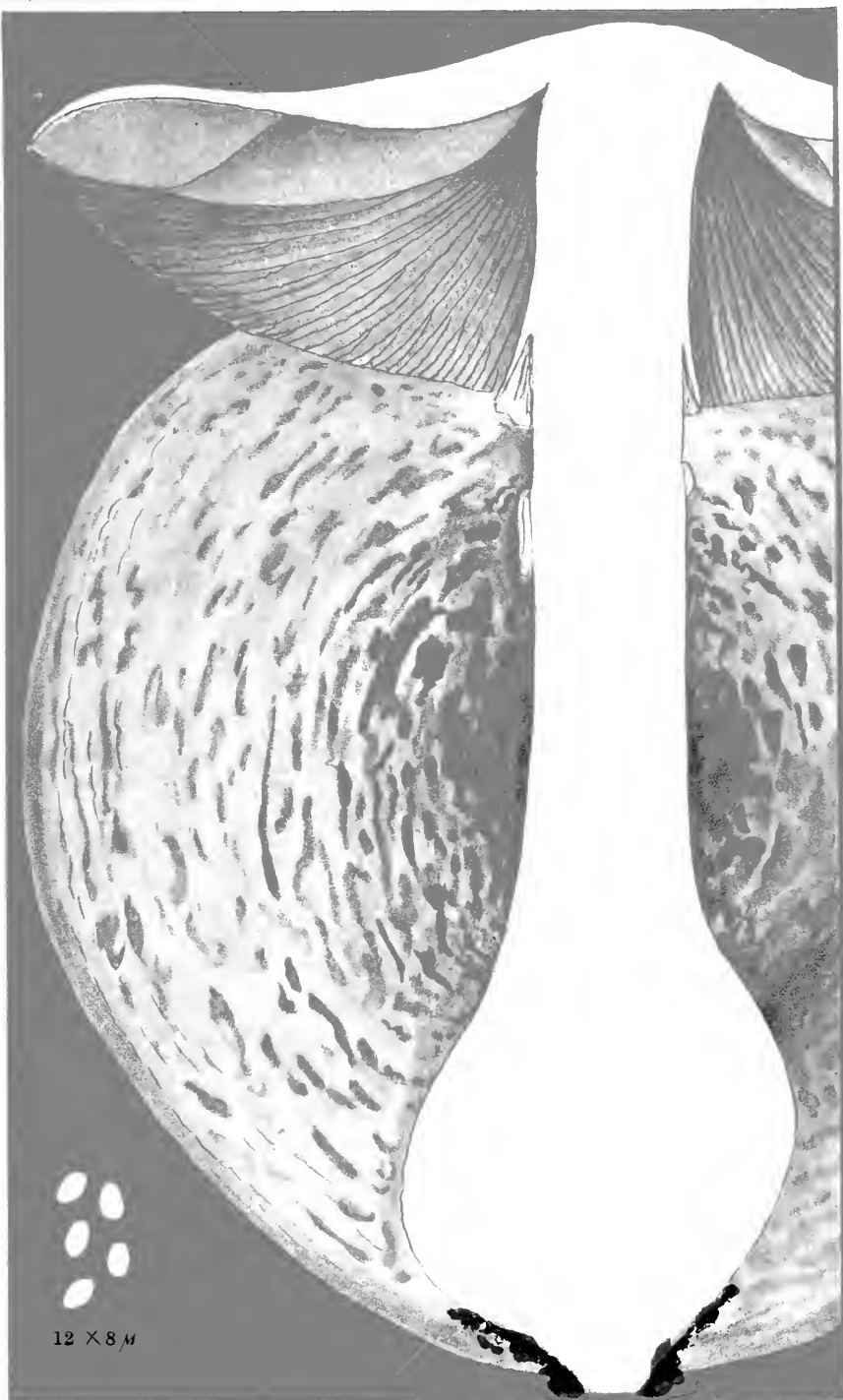
SERIES 4. PRATELLI.

- 708. Agaricus (Chitonina) rubriceps.** *Cooke & Mass. Grevillea xv., 57.*

Cooke Illus. Supp. t. 967. See *ante* p. 132.

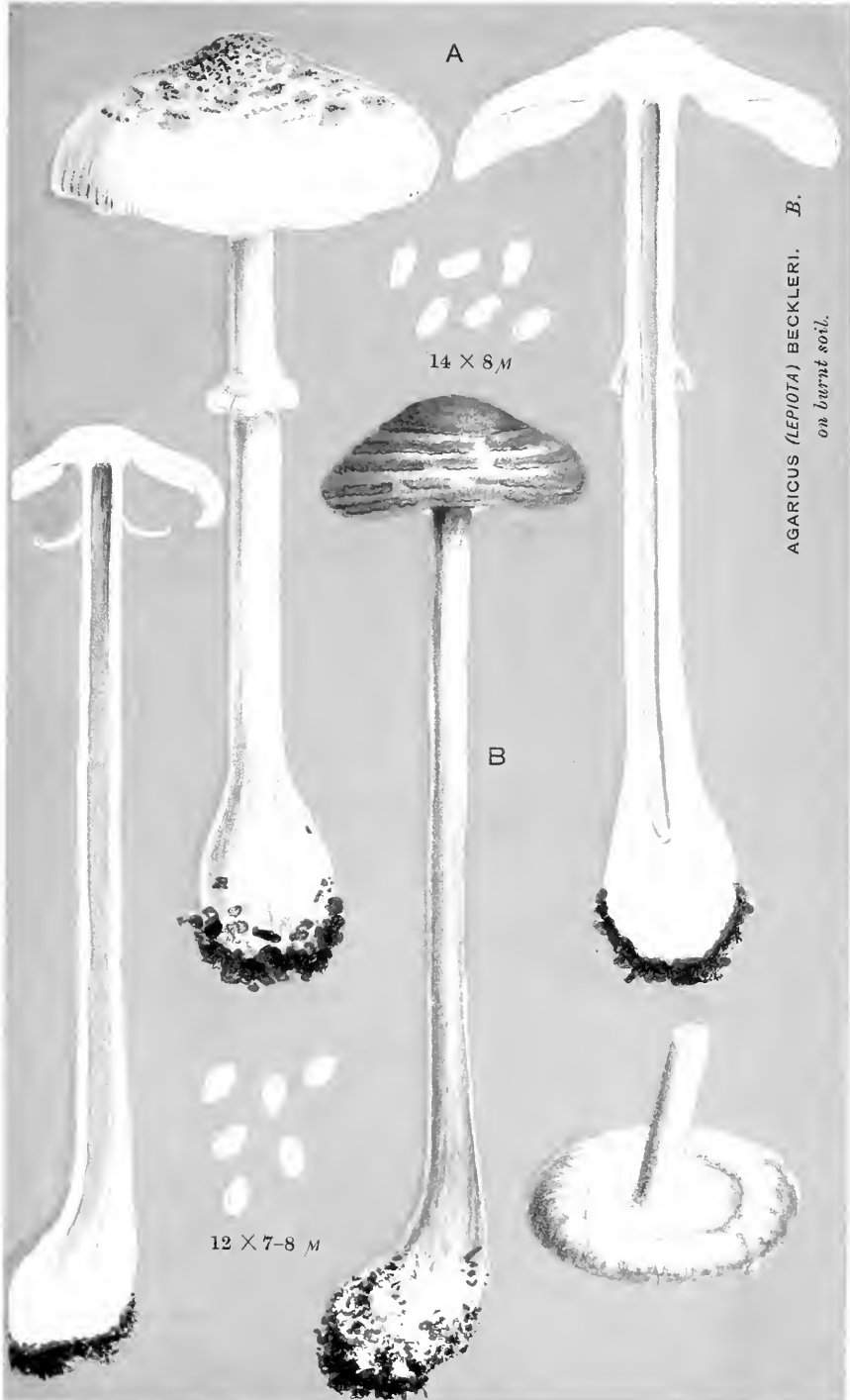
- 719. Agaricus (Psalliota) sagatus.** *Fries Hym. Eur. 281.*

Cooke Illus. Supp. t. 968. See *ante* p. 196.



12 X 8 M

AGARICUS (LEPIOTA) OCHROPHYLLUS. Cke. & Mass,
on sandy soil. Brisbane.



AGARICUS (LEPIOTA) BECKLERI. B.
on burnt soil.

AGARICUS (LEPIOTA) STENOPHYLLUS. Cke. & Mass.

on the ground. Endeavour River

AGARICUS (LEPIOTA) SUBCLYPEOLARIUS. B. & Br.
on the ground. Victoria.



AGARICUS (LEPIOTA) LEONTODERES. B. & Br.



AGARICUS (LEPIOTA) BUBALINUS. Berk.

on buffalo dung. See Melbourne

755 bis. *Agaricus (Hypholoma) catarius.* *Fries Hym. Eur.* 296.

Catar'ius = of or belonging to a cat (*catta*) ; a variant of *felinus*, to avoid confusion.

Pileus fleshy-membranaceous, hemispherical, then expanded, smooth, hygrophanous ; stem fistulose, short, thin, *rather shining*, white, *incrassated at the base*, and white floccose, striate at the apex ; gills adnate, white, then fuscous.—*Cooke Illus. Supp. t.* 1176.

On the ground amongst grass.

Gregarious, subcæspitose, ochraceous, pileus scarcely 1 in. diam. Stem about $1\frac{1}{2}$ in. long ; spores $6 \times 3 \mu$.

757 bis. *Agaricus (Hypholoma) instratus.* *Britz. Melan, f.* 110.

Instra'tus = covered over.

Cæspitose. Pileus hemispherical, convex, broadly umbonate (1 in. or more), dark brown, radiately rugose, stem hollow, equal, white and smooth above, fibrillose or squamulose below, veil white, appendiculate. Flesh brownish. Gills subventricose, adnate, brown, then purple brown, paler at the edge. Spores $8 \times 4 \mu$.—*Cooke Illus. Supp.* 1157.

On stumps.

Possibly these specimens belong to the above species of Britzelmeyer, but we have been compelled to expand the description.

763. *Agaricus (Psilocybe) areolatus.* *Klotsch.*

var. *virescens*, *C. & M. Cooke Illus. Supp. t.* 1177.

Virescens = greenish.

Differing from the type in the green colour of the pileus.

779. *Agaricus (Psilocybe) clivensis.* *B. & Br.*

Cooke Illus. Supp. t. 969. See *ante* p. 212.

785. *Agaricus (Psathyra) gyroflexus.* *Fries Hym. Eur.* 305.

Cooke Illus. Supp. t. 970. See *ante* p. 214.

SERIES 5. COPRINARII.

804. *Agaricus (Panæolus) scitulus.* *Massee, Grev. XVI., p.* 65.

Cooke Illus. t. 927 B. See *ante* p. 219.

This species belongs to Saccardo's genus *Anellaria*, together with *Ag. separatus*, on account of the ring.

780. Agaricus (Psathyra) conopileus. Fries.

See *ante* p. 213.

var. **superbus**, Jungh. *Cooke Illus. t.* 1158.

866 bis. Bolbitius conocephalus, Bull. Champ. t. 563, f. 1. Fries
Hym. Eur. p. 334.

Cono-ceph'alus = with a conical head (or pileus).

Pileus membranaceous, conical, hygrophanous, disc even, slightly viscid, margin striate; *stem fistulose, equal, smooth, shining, rather tough, white*; gills free, ventricose, dingy, then ferruginous. Spores $18 \times 9-10 \mu$.—*Cooke Illus. Supp. t.* 1160.

On the ground in palm house.

868 bis. Bolbitius grandiusculus. Cke. & Mass., Grev. XVIII., 53.

Grandius'culus = pretty well grown up.

Pileus campanulate, expanded (1-2 in diam.), smooth, pallid and faintly striate at the margin, rufous at the apex, stem smooth, white, fistulose, slender, gradually attenuated upwards. (3-4 in. long), gills crowded, linear, narrow, attenuated behind and free, rusty ochre. Spores $15 \times 5 \mu$.—*Cooke Illus. Supp. t.* 1159.

Amongst grass on the cliffs.

903 bis. Cortinarius (Phlegmacium) testaceus. Cooke.

Testa'ceus = brick-coloured.

Pileus fleshy, convex, then flattened and obtusely umbonate, or depressed (7-10 c.m. broad), brick-red, rather vinous, growing paler with age, smooth, even, viscid; stem (8-9 c.m. long, $1\frac{1}{2}$ c.m. thick) attenuated upwards, from a sub-marginate, bulbous base, whitish above, becoming rufous about the base, solid, longitudinally fibrously striate below; flesh rather flesh-coloured, becoming ruddy at apex and base. Gills broad (1 c.m.), scarcely crowded, adnate, a little emarginate behind, dusky cinnamon; spores elliptic, narrowed at each end, rough, $16 \times 8 \mu$.—*Cooke Illus. Supp. t.* 1190.

On the ground.

†† DELIBUTI.

* *Gills whitish, then clay-coloured.*

923 bis. Cortinarius (Myxacium) nitidus. Fr. Hym. Eur. 356.

Nit'idus = shining, beautiful (*maxime insignis*, Fries).

Pileus fleshy, convex, then plane, or depressed, smooth, viscid, discoid, tan colour (2-5 in. broad). Stem somewhat stuffed, clavate, elastic, white, at first viscid, *whitish mealy at the apex*, then

naked, and dry (2-4 in. long, $\frac{1}{2}$ in. thick); gills equally attenuated and decurrent, crowded, narrow, clay-coloured. Spores obovate, pale, $10-12 \times 8 \mu$, flesh white.—*Cooke Illus. Supp. t. 1191.*

On the ground.

984 bis. Cortinarius (Telamonia) lucorum. *Fries Hym. Eur. p. 377.*

Lucorum = of groves.

Pileus even, when moist bay-brown with a tinge of brick-red; stem firm, clavate, fibrillose, of one colour, pallid; gills emarginate, rather distant, watery cinnamon, with a fugacious tinge of violet flesh-colour. Spores elliptical, smooth, $10 \times 5 \mu$.—*Cooke Illus. Supp. t. 1192.*

On the ground.

990 bis. Cortinarius (Telamonia) croceofulvus (D. Cand). *Fr. Hym. Eur. p. 379.*

Croc'eo-fulvus = saffron-tawny.

Pileus fleshy, flattened, umbonate, even, orange-tawny (4 in. diam.); stem solid, equal, yellow, becoming reddish, zoned with an orange line (3-4 in. long, 4 lines thick), pale at the apex; gills adnate, becoming ferruginous. Spores obovate, rough, $8-10 \times 6 \mu$.—*Cooke Illus. Supp. t. 1193.*

In woods.

1032 bis. Cortinarius (Hydrocybe) angulosus. *Fries Hym. Eur. 392.*

Angulosus = full of corners.

Pileus rather fleshy, flattened, repand, fragile, quite smooth, hygrophanous, *warm tawny yellow* (ochraceous and opaque when dry, 3 in. diam.); stem hollow, twisted, equal, striate, tawny, very fugacious, cortina tawny (3 in. long, 2-3 lin. thick); gills adnate, *thick, rather distant, tawny*, edge entire of the same colour.—*Cooke Illus. Supp. t. 1178.*

In fir woods.

1057 bis. Paxillus (Lepista) Alexandri. *Fries Hym. Eur. 401.*

Alexandri, in honour of P. Alexandre, who gathered the first specimens.

Pileus fleshy, compact, plane, then depressed, dry, unpolished, *fawn-colour*, margin closely involute, rather striate when expanded (2-3 in. broad); stem stout ($\frac{1}{2}$ in. long to 1 in. thick); gills rather decurrent, crowded, colour of boxwood. Spores $9 \times 5 \mu$.—*Cooke Illus. Supp. t. 1162.*

Amongst moss.

- 1124. Hygrophorus (Hydrocybe) spadiceus.** Scop. Carn. II., 443.
Fr. Hym. Eur. 420.

Spadiceus = of a chestnut-brown colour.

See ante p. 304. Cooke *Illus. Supp. t.* 1161.

- 1154 bis. Lactarius involutus.** Soppitt. Cooke *Illus. t.* 1194.

Every part white, with pale ochraceous tinge. Pileus 1-2 in. across, firm, equally fleshy up to the margin, smooth, even, convex, becoming plane or slightly depressed, margin arched, strongly involute, extreme edge minutely silky; stem solid, equal or slightly incrassated below, glabrous, even, about 1 in. long by 3 lines thick; milk not scanty, white, very hot, unchangeable; gills sub-decurrent, densely crowded, very narrow, sometimes forked; spores white, pip-shaped, smooth, $5 \times 3 \mu$.

On the ground.

This may be *Lactarius scoticus*, which we have never seen.

- 1145. Lactarius squalidus.** Krombh.

See ante p. 309. Cooke *Illus. Supp. t.* 1195.

- 1197 bis. Russula (Furcatæ) virginea.** C. & M., Grev. XIX., 41.

Virginea = virgin; from its whiteness.

Mild. Pileus fleshy, firm, convex, then depressed (5 c.m. diam.), smooth, even, viscid when moist, polished when dry, margin even, snow white. Stem attenuated upwards, firm, solid (5 c.m. long, 2 c.m. thick at the base), finely rugulose; gills very narrow, crowded, subdecurrent, repeatedly forked, connected by veins, brittle, as well as the stem, quite white. Spores globose, 4μ .—Cooke *Illus. Supp. t.* 1197.

On the ground, under trees.

- 1225. Russula (Fragiles) ochroleuca.** Pers. See ante p. 332.

var. **Claroflava** (Grove). *Russula claroflava*. Grove *Midl. Nat.* 188, p. 265.

Claro-flava = of a clear yellow.

Pileus (2-3 in.) convex, at first bullate, then plane, slightly depressed in the centre, chrome-yellow, margin turned down, at length patent, perfectly even or slightly striate when old, often paler than the disc, but sometimes of a deeper colour, cuticle not so easily separable as in *ochroleuca*; flesh white, yellow beneath the cuticle; stem $1\frac{1}{2}$ - $2\frac{1}{2} \times \frac{1}{2}$ - $\frac{3}{4}$ in., smooth, white, cylindrical, blunt at base, slightly spongy within, at length rugose and cinereous, or even blackish; gills scarcely crowded, not reaching the stem so

much as in *ochroleuca*, not united behind, white, [then altogether pale lemon-yellow, at length sub-ochraceous.—*Cooke Illus. t.* 1196.

Amongst grass, in damp places.

1236. *Russula (Fragiles) nitida.* Pers. (ante p. 336).

By error the two varieties of this species have been transposed in the text, so that they stand under No. 1235 as varieties of *R. Barlæ*, whereas they are varieties of *R. nitida*, and should have appeared as *Russula nitida*, var. *cuprea*, *Krombh.* See *Cooke Illus. t.* 1095 B; and *Russula nitida*, var. *pulchralis*, *Britz.* See *Cooke Illus. t.* 1095 A.

1142. *Russula (Fragiles) nauseosa.* Pers. (ante p. 338).

The more common forms are figured in *Cooke's Illus. Supp. t.* 1147.

1259. *Cantharellus reflexus*, var. *devexus.* Fries. See ante p. 242.

Figured in *Cooke Illus. t.* 1150, f. A.

In addition to the foregoing, the following should be referred to their respective places :—

27. *Agaricus (Lepiota) hispidus.* Lasch. See ante p. 13.

Figures in accord with drawing by Fries. See *Cooke Illus. Supp. t.* 1180.

35 bis. *Agaricus (Lepiota) licmophorus.* Berk. & Br. *Ceylon Fungi*, No. 20. *Lepiota flammula*, *Gillet Champ. Fr.*

Licmoph'orus = bearing a winnowing-fan (λικμός).

Pileus (1 in.) lemon-coloured, membranaceous, deeply plicately sulcate, up to the disc, margin crenate; stem ($3\frac{1}{2}$ in. high, 1 line thick) attenuated upwards, truncate at the base, ring half way up; gills distant, slightly arched, remote, interstices veined, spores lemon-shaped.—*Cooke Illus. t.* 1179.

On the ground in hothouses.

57 bis. *Agaricus (Armillaria) citri.* Inzenga *Sic. t.* 3, f. 1. *Fr. Hym. Eur.* 46.

Citri = of citron, citron-coloured.

Caspite; pileus fleshy, thin, convex, then plane, rather umbonate (about 1 in. broad), smooth, sulphur yellow, margin crenulate,

becoming white; stem slender (2-3 in. long, 1 line thick), whitish, floccose at the apex, pallid (rufescent at the base); gills adnate, crowded, white. Spores minute, $5 \times 4 \mu$.—*Cooke Illus. Supp. t. 1181.*

On stumps; odour of fresh meal.

107 bis. Agaricus (Tricholoma) circumtectus. *Cooke.*

Circum-tectus = covered round; from the tomentose margin.

Pileus convex, dry, fleshy (2-3 inches diam.), very obtusely umbonate at first, or not at all, disc tawny, cracking a little when old, circumference olive or dusky, margin tomentose, incurved, sinuate; stem obclavate, or sometimes attenuated downwards (1-2 c.m. thick, 4 c.m. long), whitish, striate, firm, solid; gills reaching the stem, a little sinuate, scarcely crowded, white. Spores subglobose, minute, about 4μ diam.—*Cooke Illus. Supp. t. 1182.*

On the ground.

135 bis. Agaricus (Clitocybe) opiparus. *Fries. Hym. Eur. 83. Icones t. 49, f. 1.*

Opip'arus = richly furnished, splendid.

Pileus compact, convex, then plane, obtuse, even, smooth, *flesh coloured, shining* (2-4 in. diam.); stem solid, stout, smooth ($\frac{1}{2}$ in. thick); gills a little decurrent, crowded, connected by veins, white.—*Cooke Illus. Supp. t. 1183.*

In mossy places.

159 bis. Agaricus (Clitocybe) occultus. *Cooke, Grer. XIX., 40.*

Occultus = hidden, inconspicuous.

Pileus fleshy, convex, then plane, and depressed, even, smooth, but innately virgate (5-7 c.m. diam.), viscid, pallid, smoky about the disc, whitish at the margin, stem equal, or slightly expanded above into the pileus, solid, white, striately fibrillose (4-6 c.m. long, 1 c.m. thick), often curved; gills rather distant and broad (to 5 m.m.), adnate, a little decurrent, scarcely emarginate, white; substance white, tough, cartilaginous.—*Cooke Illus. Suppl. t. 1184.*

Gregarious on charred ground.

233 bis. Agaricus (Collybia) eustygius. *Cooke, Grer. XIX., 40.*

Eustygius εὐ-στυγίος = veritably Stygian from its blackness.

Pileus rather fleshy, convex, then plane, sometimes depressed (3-5 c.m. broad), even, smooth, becoming shining when dry, tough, dingy-white, a little darker about the disc, margin thin, smooth, occasionally flexuous, stem stuffed, rarely hollow, attenuated

downwards into a rooting base (5-8 c.m. long, 6-8 m.m. thick), white above, sprinkled with small punctate scales, darker below, and often becoming fuliginous, somewhat longitudinally striate or fibrous; gills rather broad, rounded behind, not crowded, dark grey. Spores white, globose, 4-5 μ . Odour of rancid meal. Whole plant in drying becoming black.—*Cooke Illus. Suppl. t. 1185.*

On the ground.

231 *Agaricus (Collybia) murinus.* *Batsch.*

See *ante*, p. 74. *Cooke Illus. t. 1198.*

280 bis. *Agaricus (Mycena) consimilis.* *Cooke, Grer. XIX., 41.*

Con-similis = similar to, from its great likeness to two or three allied species.

Gregarious. Pileus membranaceous, conically campanulate, soon with the margin reflexed ($2\frac{1}{2}$ -3 c.m. broad), striate to the middle, at length splitting, smooth, opaque, cinereous with umbo darker. Stem attenuated upwards, often compressed below, rather rigid, dry, smooth, paler than the pileus (4 c.m. long, 2 m.m. thick above, nearly twice as thick below), fistulose; gills slightly adnate, nearly free, linear, scarcely crowded (2 m.m. broad), cinereous. Odour none.—*Cooke Illus. Suppl. t. 1186.*

Among grass.

630. *Agaricus (Naucoria) lugubris.* *Fries.* See *ante* p. 173.

Figured in *Cooke Illus. Suppl. t. 1187.*

731. *Agaricus (Stropharia) merdarius.* *Fries.* See *ante* p. 200.

var. **major.** *Fries Icon. t. 130, Fig. 3.*

Much larger, pileus gibbous, straw colour. Stem stuffed.—*Cooke Illus. Suppl. t. 1188.*

735. *Agaricus (Stropharia) scobinaceus.* *Fries.* See *ante* p. 201.

Figured in *Cooke Illus. Suppl. t. 1189.*

The foregoing descriptions of *Agaricini* include all the species known to be indigenous to Great Britain up to date. Coloured figures of nearly all these have been published in "Illustrations to British Fungi," references to which are added in the text. With a complete index to follow, this will constitute the first volume of reprint and revision of the "Handbook of British Fungi."

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OMITTED DESCRIPTION.

88 bis. *Agaricus* (*Tricholoma*) *tenuiceps*, Cke. & Mass., in *Illustrations British Fungi*, Plate 1166.

Pileus convex, obtuse, dry, granular, opaque (2-3 in. diam.), fuliginous, rather shining when old; flesh, except the disc, very thin; stem robust, solid (3 x 1 in.), tough, slightly attenuated upwards, ochrey white, everywhere granularly punctate, with thick cord-like mycelium; gills rounded behind, rather distant, ventricose, white; spores globose, 6-7 μ diam.

Under trees. Kew. July, 1888.



SYSTEMATIC INDEX

TO ILLUSTRATIONS OF FUNGI.

VOLS. I. TO VIII.

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